ORTHOPÆDIC AND REHABILITATION SERVICE OF THE ROYAL AIR FORCE

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Now that a National Health Service is imminent and planning is the order of the day, it may be helpful to describe briefly the Royal Air Force combined orthopædic-rehabilitation service. It forms part of a State-controlled medical organisation—the R.A.F. medical services—and it includes the first comprehensive scheme of rehabilitation to be introduced on a national scale. In my view this orthopædic-rehabilitation service is a working model applicable, with modifications imposed by local circumstances, to many if not all the regions into which it is proposed to divide this country.

The scheme was born in the grim days of the late summer and early autumn of 1940. The credit for its origin and development is due to Sir Reginald Watson-Jones, supported strongly by the Director-General of the Medical Services, Sir Harold Whittingham, and assisted with great ability and enthusiasm on the rehabilitation side by Dr. H. E. Moore and Group-Captain C. J. S. O'Malley.

At first orthopædic centres were established in the United Kingdom in five R.A.F. general (base) hospitals, with three geographically separate rehabilitation centres. Later the number of home-based orthopædic centres or subcentres increased to ten. The sites were chosen in relation to the local needs—e.g., some were in the heart of Bomber Command, others amidst large groupings of training depots, and so on. Each served a region in which the medical organisation consisted of the base hospital, one or more station hospitals, unit sick-quarters, and, in some, casualty air-evacuation sections. The whole scheme on the specialists' side was run by 2 consultants and a senior orthopædic specialist, all of whom travelled from place to place training junior colleagues and supervising treatment; 8 orthopædic specialists; and some 21 other surgeons of junior rank—about 32 doctors in all. In view of the number of patients, inpatient and outpatient, and the severity and complexity of the casualties, this quota of medical officers is not excessive.

RESULTS

In the five-year period 1941–45 inclusive, 62,210 inpatients were treated for major, often multiple, injuries, from the time of injury until maximum recovery, with no break in continuity of treatment. Outpatients during the same period numbered 153,472. Of the inpatients, 20,556 required treatment in special rehabilitation centres.

The success of the organisation can be judged by the fact that 77% returned to full duty, flying and other trades; 18% were retrained or returned to modified duties in the Service; and 4·8% were invalided because maximum physical recovery was insufficient for Service requirements, or perhaps because of psychological complications. The records of the patients treated in rehabilitation centres—i.e., the most severely injured group—show that the average period of disability per person was nineteen weeks, nine of which were spent in a rehabilitation centre.

GENERAL HOSPITAL

I have been greatly impressed by the completeness of the help which it has been possible to offer the patient in this orthopædic structure. Some idea of it can be gained from the facilities available to an injured airman admitted to a R.A.F. general hospital.

(1) *He has no immediate economic worries.*—His pay continues, and so do his family and other allowances. The great advantage of this economic background to the surgeon who starts and continues treatment must be emphasised.

(2) *He is treated in an orthopædic unit of about* 100–150 *beds by a team* of surgeons, nurses, technicians, and orderlies specially trained to restore him to maximum recovery in the shortest time. Every single member of the team must make at least two contributions: the exercise of professional skill, and the exercise of a cheerful confident personality which so inculcates the will to get well that apathy never develops. The aloofness of a surgeon may tilt the scales against his professional skill, however great that may be. One most skilful surgeon, known as "the Fuehrer" because of his unbending attitude, sent to our rehabilitation centres patients with straight limbs but with sadly warped minds. Another was an indifferent surgeon but a man of great personality, and he sent men with not so straight limbs but with a spirit which nothing could quell. The combination of these qualities is surely the hallmark of a good doctor, and in my experience it is one of the most important, if not indeed *the* most important, factor in rehabilitation.

Apart from skilled nurses, whose importance it is unnecessary to emphasise, the team consists of the following members:

(*a*) Three surgeons of different seniority, the most senior being of specialist rank corresponding in civil life to a very senior registrar or a junior consultant. The work of this team is under regular supervision by the two Royal Air Force consultants and the senior specialist in orthopædic surgery, who are also available at short notice in case of emergency.

(*b*) Radiographers, who provide a 24-hour service, well equipped with mobile X-ray sets. Radiographic control of fracture treatment is strict; no manipulation or change of plaster is left unchecked by radiography in as many planes as necessary to be certain of position and alignment ("economy" in radiograms is dangerous, a fact which will have to be faced realistically by voluntary hospitals).

(*c*) Clinical secretaries and clinical photographers, who ensure that complete records are available. A clinical photograph and prints of important radiograms are worth many pages of notes. One page of dictated typewritten notes is worth many sheets of illegible handwriting. These records follow the patient from hospital to rehabilitation centre, and from rehabilitation centre to hospital, so that there is unbroken continuity of his narrative. When treatment is completed and the patient returns to duty, the records are returned to his original R.A.F. orthopædic unit for scrutiny by the surgeons who were responsible for initial treatment. Thereafter they are stored in a central repository to be available for follow-up review.

(*d*) Rehabilitation orderlies, three to each 100 beds, specially selected and specially trained, who work under the orders of the orthopædic surgeons. They are chosen not only for ability but also and more particularly for personality. All candidates for these posts are selected personally by one of the consultants in orthopædic surgery. They must be bright, alert, and optimistic. Their duty is to ensure that every patient performs his exercises regularly for not less than five minutes every hour and to inspire the patient in a spirit of enthusiastic coöperation with the team. One orderly is posted to every ward. His principal duty is to give individual instruction to every patient, to supervise the hourly exercise of every patient in the ward, to promote a general spirit of enthusiasm, and to organise games and recreations in convalescent rooms, solaria, and hospital grounds. I find it impossible to emphasise too much the importance of ward-rehabilitation orderlies and of their influence in restoring and maintaining morale. In the Royal Air Force they were selected mainly from the group of trained nursing orderlies, but in the future they will probably be hand-picked members of the Chartered Society of Physiotherapists.

(*e*) Welfare workers, some voluntary and some specially trained, organise occupational therapy, leather work, and other diversional pursuits, provide a good library, and arrange concerts, lectures, and cinema entertainments. It is also to be remembered that patients have relations who play an important part in their lives; wives have babies; parents

suffer illness; members of the family die; fiancées become estranged. To minimise the anxieties which are inseparable from these events there are generous visiting facilities.

(3) *All specialist services are readily available.*—I am constantly impressed in the R.A.F. medical service by the speed with which a competent specialist's opinion can be obtained—usually within a day. When a patient waits many days for further opinions, with varying degrees of apprehension, there is not only a waste of beds but also a lowering of morale. These delays were a conspicuous feature of pre-war hospital life.

A lesson which has been emphasised strongly by R.A.F. experience is the importance of close liaison between orthopædic and plastic surgery. Units organised by the civilian consultant in plastic surgery, Mr. A. H. McIndoe, have made an important contribution. Patients do not spend weary months waiting for wounds to heal by granulation. Secondary suture, excision of scars, and skin grafting allow the orthopædic surgeon early access to the primarily difficult or to the late ununited fracture. Young orthopædic surgeons in the R.A.F. have been trained in first-aid plastic surgery. It is most important that every surgeon who deals with accidents should be given such training, so that wounds can be covered with skin before infection supervenes.

REHABILITATION CENTRES

Through the help of the British Red Cross Society it was usually possible to have one of their hospitals near each R.A.F. orthopædic centre for use as a primary rehabilitation unit. A masseuse and a rehabilitation orderly carry out a regime of treatment similar in principle to that in the larger R.A.F. centres but on a smaller scale. This B.R.C.S. help is of great value in freeing hospital beds and in providing treatment for those not yet fit to go to the larger centres, and who would otherwise have to be sent on sick-leave. From these small efficient units many men return to their units to full duty.

At the end of treatment in the hospital or primary rehabilitation unit about a third of all patients are transferred by road or air ambulance or by train to an R.A.F. rehabilitation centre. Six centres, totalling over 1000 beds, were established to accommodate different groups of patients: (1) officers, aircrew and others; (2) N.C.O. aircrews; (3) technicians (electricians, fitters, armourers, &c.); (4) ground staff (unskilled); (5) W.A.A.F. personnel; and (6) returned prisoners-of-war. This division worked well. On the whole, aircrews are younger; they are trained to be aggressive in the highest degree, and unless wisely handled they are liable to project this aggression to doctors, hospitals, and rehabilitation centres. Compared with technicians, their outlook, pursuits, and hazards are different. Technicians are older; they are highly skilled tradesmen; they require different handling and a different approach. It is clear also that injured women and, still more, returned prisoners-of-war require special handling. But there is a common pattern in the facilities and programme of work at all the centres.

By rehabilitation a man is restored mentally, physically, socially, and technically to his former state, and treatment should usually follow that sequence. It is convenient to describe the organisation of R.A.F. rehabilitation centres under three headings—mental, physical, and technical.

(1) *Mental Rehabilitation.*—The maintenance of high morale is one of the most important factors in restoring health. I am convinced that successful treatment is three-fifths mental and two-fifths physical. The rehabilitation unit should not be far from a town and preferably a seaside resort—far enough to be seclusive, near enough to allow easy access to the amenities of the resort.

If the patient has been well handled in hospital, he does not arrive at the rehabilitation centre in a spirit of apathy, suspicion, and hostility. Nevertheless, his reception must be warm and efficient; first impressions are lasting; there must be no hanging about; he must go straight to a receptionist, who provides him with full information of the whereabouts of his bedroom, the daily routine, the time of local trains and cinemas, and the general plan of organisation.

The staff must have ability and enthusiasm, the atmosphere must be jolly; it must combine real endeavour with fervour; there must be little of the cold logic of a scientific laboratory. There must be a library, brains trust, and organised lectures and discussions. The evening programmes should be a judicious blend of light and intellectual activities—dances (which mean a band), cinemas, concerts, &c. Woodwork and metal workshops for diversional purposes in off-duty hours are very popular.

Social interchange calls for a moderate quota of alcohol, and if this is not provided in the centre it will be secured elsewhere with perhaps less desirable results. A bar, with a reasonable ration of beer or light wines, was originally considered revolutionary, but in R.A.F. rehabilitation centres it has proved its worth. It must be furnished tastefully. As a colleague puts it: "decoration and environment condition the behaviour of the patient, and a four-ale bar with sawdust on the floor induces the behaviour which is normally found in such a bar."

As in hospital, the contact of patients with friends and relations is maintained by visits and by judicious periods of week-end leave. A sense of citizenship is developed by visits to factories, mines, and other industrial activities. Patients see how their fellow-men live; they appreciate the efforts made during war; they gain much in mental and social equipment.

(2) *Physical Rehabilitation.*—Each unit has more or less the same set-up of gymnasia, swimming-pools, playing-fields for games and exercises, tennis courts, squash courts, volley-ball courts, and so on—the whole in bright cheerful attractive surroundings. The subsoil should be sandy to allow good drainage and drying, so that outdoor games and exercises can be undertaken regularly even in the changeable weather of this country. The extent to which the grounds are available for exercises and games is of significance in determining how much gym space is required. Broadly speaking, for 250 patients, about a third of whom at any one moment will be in too early a stage for gym work, a gymnasium 140 ft. × 80 ft. × 40 ft. affords sufficient room for exercises and indoor games and for annexes for consulting-rooms and physiotherapy. Sleeping accommodation in small dormitories and good messing facilities are essential. They are close to the scene of the day's activities.

To cope with 250 patients and allow for periods off duty through illness, leave, or attendance at refresher courses the following team, reinforced by regular visits of the consultants or specialists in orthopædics, is required to maintain efficiency:

Doctors: 1 senior and 3 junior medical officers. (This ideal of about 60 patients to each M.O. was never achieved because of the general shortage of doctors.)

Physical fitness officer: 1.

Masseuses: 9 (or 6 masseuses and 3 rehabilitation orderlies).

Physical training instructors (P.T.I.): 12.

After trial of many methods patients were divided into three flights, each with three subgroups:

"A" flight (tibia, ankle, and foot) } divided into { Non-weight-bearing
"B" flight (knees and femurs) } divided into { Medium " "
Full " "

"C" flight (arms and spines) divided into { Early / Medium / Late

It is sometimes necessary to establish a small separate group of backward patients for individual attention. Each flight has 1 medical officer, whose team consists of 2 masseuses (or 1 masseuse and 1 rehabilitation orderly) for non-weight-bearing leg or early arm cases; 2 P.T.I. for medium-weight-bearing leg and medium arm cases; and 1 P.T.I. in charge of the late arm cases.

Each P.T.I. remains with his group throughout the day, instructing and encouraging them in their exercises and joining in their games. A backward patient receives more individual attention. It has been found that after general training in the work of a rehabilitation centre a P.T.I. will prove himself more competent in one sphere of activity than another. For example, an instructor may be almost useless in the individual remedial work required in intermediate groups but ideal in the handling of fully active groups. It is advisable to encourage at least a degree of specialism, and it is certainly unwise to change instructors from one group to another too often. The optimal period of control of a single group is about 9–12 months.

A physical fitness officer, who is usually a commissioned P.T.I. of outstanding quality, is responsible for coördination of the work of all P.T.I. in the centre. He acts as intermediary between doctor and P.T.I.; he spends his day in the gymnasium and playing-fields and exercises general supervision.

Patients are supplied with appropriate gym kit. A programme is so arranged that overtiring and monotony are prevented. Each period of 20-min. activity is followed by 10-min. rest and relaxation (or 30-min. work by 15-min. rest). The original ratio of 40-min. work to 20-min. rest proved too exhausting. Each group is changed from a period of remedial activity to, for example, cycling, then swimming, then games (net-ball, volley-ball, football), rambles, and so on. From three to four hours a day is thus spent in active physical endeavour of varyingly strenuous degree. We have found this to be the greatest physical activity which can be tolerated with advantage during one day.

(3) *Technical Rehabilitation* (*Retraining*).—It soon became apparent that no medical officer could hope to be acquainted intimately with all the details of flying, wireless operating, navigation, gunnery, and every type of highly skilled technical trade Thus, even when physical rehabilitation was far advanced, it was often difficult to know whether or not a man was fit for all the intricate details of his work. Further, when incapacity lasted many months, every man lost touch with his technique and became stale; at whatever stage he returned to duty, refresher courses were needed. These two problems were solved by providing, at each rehabilitation centre, hutments which included representative sections of various trades, each with trained instructors—the vocational wing. After using these wings as occupational and vocational adjuncts, it became possible to estimate their value. Generally speaking, aircrews could maintain their proficiency and keep themselves up to date. In ground trades, however, technical facilities in the rehabilitation centre were of value only when maximal or nearly maximal physical recovery was achieved. Refresher courses in the workshop allowed medical officers in collaboration with instructors to estimate the degree of technical recovery and to decide whether or not limitation of industrial activity was desirable.

RESETTLEMENT

The airman whose recovery is complete presents no problem in disposal. It is when he is adjudged unfit for his full previous duties that difficulties arise in resettlement. These problems are determined while the patient is still under treatment in the rehabilitation centre. It is at this stage, above all others, that break in continuity of treatment and control is to be avoided at all costs. The R.A.F. has such a wide variety of trades that almost every patient with a persistent disability can be accommodated in useful work. Further, the usual routine and hardships of Service life can be ameliorated by suitable alterations in category. Thus no more than a very small fraction of injured airmen were invalided out of the Service. Even after most complicated and difficult multiple injuries resettlement within the Service was usually achieved.

The position may be summarised thus:

(1) If disability was permanent and severe enough to prevent the airman continuing his former work, he was remustered and trained in a fresh trade within his physical and mental capabilities; in exceptional cases he was invalided.

(2) A special department of Air Ministry maintained liaison with the Ministry of Aircraft Production for the temporary employment of airmen with burns or orthopædic injuries whose recovery would be long delayed, or in whom a course of operations at long intervals would be needed. The men remained in uniform and received full Service pay and allowances. This department also found employment for and otherwise assisted men who were invalided from the Service, regardless of the fact that they were usually awarded State pensions.

CONCLUSIONS

Many old lessons have been reinforced and strengthened by R.A.F. experience:

(1) Team-work is essential. The right man should be "hand-picked" for the right job. Every member of the team has a dual task—the exercise of professional skill and the exercise of a cheerful confident personality.

(2) There must be unification of control of the patient from the beginning to the end of treatment, including regular supervision in rehabilitation centres. *The unity of control is that of team rather than of an individual.*

(3) Good surgery and good rehabilitation are of equal importance. The art, as well as the science, of "good doctoring" must be used to inspire and maintain confidence.

(4) Patients are ready to accept treatment in residential rehabilitation centres, even after long spells in hospital, provided there are adequate facilities for maintaining occasional but regular contact with relations. This readiness is not due solely to Service discipline.

(5) Not more than a third of all injuries require rehabilitation in residential centres.

I would like to express my thanks to the administrative medical officers of the R.A.F. of all ranks for their coöperation; and to acknowledge with gratitude the devoted and uncomplaining application to duty, and the zeal, of every member of the R.A.F. orthopædic-rehabilitation team.

. . . "One of the more important properties of hormones is that they are not species-specific in their action. This lack of zoological specificity extends far beyond mammals. Almost all the hormones studied in mammals appear to be present in the lower vertebrates, birds, frogs and toads, reptiles, and fish, and to have in these animals functions and effects similar to those seen in mammals. Moreover, preparations from mammalian sources give effects in the lower vertebrates analogous to those seen in mammals. . . . The pituitary hormone, prolactin, . . . in mammals is associated with activity of the mammary gland; in birds it causes broodiness, and in a more specialised way the thickening of the walls of the crop which results in the production of pigeons' 'milk.' This hormone is known to occur lower down the vertebrate tree, and it may perhaps be associated with the peculiar brooding habits found in amphibia and fishes. The evolution of endocrine activity seems to have depended on particular organs or functions becoming sensitive to particular substances, and it may well be that the substances we now know as hormones appeared casually in the course of evolution before they acquired a function. Such a process might still be going on. Would it be too much to say that the biochemical by-product of to-day is the hormone of to-morrow?"—Mr. A. S. PARKES, SC.D., F.R.S., addressing the Royal Society of Arts in London on May 8.

LIPODYSTROPHY AND HEPATOMEGALY
WITH DIABETES, LIPÆMIA, AND OTHER METABOLIC DISTURBANCES*
A CASE THROWING NEW LIGHT ON THE ACTION OF INSULIN

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THE pathological changes in the case reported here are strange enough, but the metabolic disturbances are so unexpected and unique as to throw a new light on the interrelationship of carbohydrate and fat metabolism and on the action of insulin. Our knowledge of this relationship, obtained mainly from the study of diabetes in animals and man, has expanded and changed greatly in recent years, and I shall first attempt to outline the present position as I see it, partly to point the strange contrast in the case to be described.

Defects of carbohydrate and fat metabolism are most clearly seen in severe and wasting diabetes. The disturbance in carbohydrate metabolism is more obvious, and the failure to store and burn sugar is certainly the *primary* defect, producing the characteristic hyperglycæmia, glycosuria, and wasting from loss of sugar. This is essentially due to defective production of insulin. In all experiments which produce severe diabetes in animals, whether by pancreatectomy, Young's (1937) pituitary extract, or alloxan, the islets are destroyed and insulin production fails. Histological damage to the islets is not always so obvious in human diabetes, but we may be equally sure that insulin is defective, because an adequate injection completely rectifies the diabetic state as long as it acts. Its most obvious action is hypoglycæmic, reducing the blood-sugar. How it does so and the fate of all the disappearing sugar are less exactly known. Experiments show clearly that insulin increases the tissue use of sugar and the storage of glycogen in the liver and muscles, but only when plenty of glucose is available and not at hypoglycæmic levels. The main stimulus to insulin secretion is the hyperglycæmia from digested carbohydrate, and the function of insulin is to make this sugar available.

At the moment the only hypothesis which explains all the experimental and clinical observations on insulin is that it facilitates the passage and penetration of excess blood-glucose into cells and enables these cells to use sugar in the various ways their innate nature and function require. What exact chemical process it catalyses, whether phosphorylisation or otherwise, is not clearly known. But in facilitating the use of sugar it turns the total metabolism preferentially to the use of carbohydrate and spares the use of protein and fat.

From this primary carbohydrate defect arises the important *secondary* disturbance of fat metabolism, manifested by the appearance in the blood and urine of the ketone bodies, oxybutyric and diacetic acid, and acetone. These are a striking and the dangerous feature of severe diabetes, leading to clinical signs of ketosis and ultimately to coma. It has long been known that these bodies appear during the processes of fat-catabolism in starvation as well as in diabetes.

It was, and is, accepted that fat is carried from the depots in the blood to the liver, which turns it into ketone bodies by β-oxidation or some such chemical step. Formerly it was thought that, for the further combustion of ketones to CO_2 and H_2O, the simultaneous combustion of glucose was necessary. We were all brought up on the phrase "Fat burns in the flame of carbohydrate," which implied an actual chemical reaction between the two whereby the combustion of one molecule of glucose burned three of fatty acids, a figure on which the carbohydrate-fat ratio, the ketogenic-antiketogenic ratio, in many diabetic diets was built in pre-insulin days. This, though ingenious, has been firmly superseded by the following new conception.

It has been proved that without the intervention of carbohydrate the ketone bodies formed in the liver are burnt directly in the muscles, in normals and diabetics alike, and are readily used as fuel in energy production. Fat does not burn in the flame of carbohydrate, but this flame stops the need for burning fat. Ketosis develops whenever insufficient carbohydrate is available and fat-catabolism has to provide the fuel requirements of the body. It is practically only in diabetes that ketone formation is so excessive as to cause acidosis and ketone poisoning, and this formation rapidly ceases when injected insulin makes carbohydrate available again. Ketosis is not an abnormal disturbance of fat-metabolism but an exaggeration of one of the normal processes of fat-catabolism. It is probably an emergency path for the speedy catabolism of fat. This new conception and the knowledge that ketones are good fuel explain many previous puzzles, including the relative muscular fitness of diabetics on high-fat and low-carbohydrate diets. It makes the old unsettled controversy over the conversion of fat into sugar rather stale and unnecessary.

I have purposely omitted different types of clinical hyperglycæmia at present grouped under the generic title of diabetes. For instance, the mild obese type of diabetes, in which the patient, though loaded with sugar, never develops ketosis may well be the result of some other process than insulin deficiency, as I shall suggest later.

Case-record

In May, 1936, an unmarried Englishwoman, aged 26, consulted our skin department about a rash which had been present for two months, mainly on the arms, knees, and neck. This was recognised as papular xanthomatosis; heavy glycosuria was discovered, and she was referred at once to the diabetic clinic for treatment. Here a pale clear urine was found to contain 6·4% of sugar, *no ketone bodies*, and a moderate cloud of protein on boiling. The blood contained 364 mg. of glucose per 100 ml.; cholesterol 417 mg. per 100 ml.; and total fat 6 volumes % (lipocrit), which separated as a thick cream on standing. She was admitted to hospital for treatment and investigation of the diabetes and lipæmia.

In childhood she had had mumps and German measles but no serious illness in all her life. There was no family history of diabetes or metabolic disease. She was an only child; her mother, aged 65, was alive and well; and her father had died at 52 from "encephalitis."

The history of her present illness showed classical diabetic symptoms for nine months, with loss of 12 lb. in this time and with a xanthomatous rash for two and a half months. Otherwise she felt energetic and fit for her work as a telephonist. Menstruation was regular and normal. Clearly, diabetic symptoms preceded overt manifestations of lipoid disturbance by many months. The normal appearance of her photograph (fig. 1) taken four years earlier makes it unlikely that her disease was of very long standing.

Fig. 1—Normal condition of patient in 1932.

Physical examination showed nothing abnormal (pulse-rate 70 per min.; blood-pressure 110/70 mm. Hg) except lipæmia retinalis, widespread maculopapular xanthomatosis, and general thinness. In a 3-in. wide encircling area of the right upper arm 120 of these spots were counted (fig. 2). The knees and the neck were also richly covered with the slightly raised yellow macules, without any inflammatory ring, but the rest of the body was unscathed. No enlargement of the liver and spleen was present at first.

* The Oliver-Sharpey lectures delivered at the Royal College of Physicians of London on March 19 and 20, 1946.

In hospital the diabetes rapidly cleared on only 20 units of soluble insulin daily, and she returned to work in a week feeling well and gaining weight. She needed more insulin soon, 50 units a day, and in four months the skin rash had disappeared, although slight lipæmia persisted. She was not seen again for over a year, when in January, 1938, she was noted to have a bulging abdomen and very *large liver and spleen*. By the end of the year the basal metabolic rate (B.M.R.) was unexpectedly found to be very high, and progressive *lipodystrophy* became more and more obvious.

CLINICAL AND PATHOLOGICAL FINDINGS DURING LIFE

In spite of many abnormalities her general health and vigour remained surprisingly good throughout her long illness. Her muscles were unusually well developed and strong for a woman, even when one remembers how lipodystrophy accentuated her muscularity.

The discovery of a *large liver and spleen* in 1938, eighteen months after the patient was first seen, introduced a new element of interest. From her story this enlargement had been coming on gradually for some four months. The liver edge was felt at the umbilicus, and the spleen 1 in. below the costal margin. This was confirmed accurately by radiography, which also showed considerably *enlarged kidneys*. The liver and spleen gradually became bigger, but so slowly that monthly examinations showed little difference. Ultimately the liver filled most of the abdomen, the right border being lost in the iliac fossa, and it extended 3 in. below the umbilicus (fig. 3). It was smooth, firmer than a fatty liver, less hard than a cirrhotic one, and never tender. It seemed to increase a little in size and firmness during severe lipæmic phases, and the patient's feelings of fullness seemed to confirm this. *Liver puncture* produced only a very small

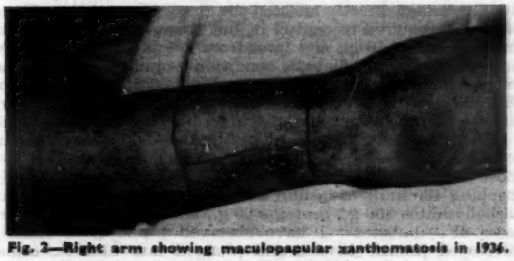

Fig. 2—Right arm showing maculopapular xanthomatosis in 1936.

sample (some five lobules) which looked normal in the fresh state but was too small to stain.

The *spleen* also increased very slowly and ultimately reached 1 in. below the umbilicus. It was much firmer than the liver but also smooth and not tender. Three *splenic punctures* produced nothing but blood and merely showed its tough consistence.

Liver-function tests remained normal. No suspicion of jaundice; no dilated veins; cholebilirubin was never present in the Van den Bergh test, which gave 0·2–0·4 unit of hæmobilirubin per 100 ml. in five estimations between 1938 and 1943. The *lævulose-tolerance test* was carried out by half-hourly separate estimations of the total blood-sugar and lævulose after 50 g. given at zero and another 25 g. at two hours. The following figures in mg. per 100 ml. show a normal function of the parenchymatous cells:

	Lævulose 50 g.				*Lævulose 25 g.*		
	Fasting	½	¼	1	1½	2	2½	3 hr.
Total blood-sugar ..	247	266	286	270	266	266	250	
Blood-lævulose ..	3·1	4·2	6·6	—	2·1	2·2	4·9	

The *kidney function* too remained normal. The urine always contained a trace of protein on boiling, and occasionally quite a heavy precipitate, but no other chemical abnormality except sugar. The deposit occasionally showed a few hyaline, and once some granular, casts. No abnormal fat or doubly refractile particles. The blood-urea always remained 34–42 mg. per 100 ml., and the urea clearance in 1938 was 120% of normal. The renal threshold for glucose was normal.

No symptoms of disturbance of the *alimentary* system were present, apart from constipation when the diabetic phases were worst. Then the appetite, always big, became enormous. Hypochlorhydria was present (1940) with 20 and 30 c.cm. of N/10 total acidity respectively before and after histamine and a complete absence of free HCl. The fæces were normal in colour and consistence and never looked fatty. Microscopical examination showed well-digested muscle-fibres, no starch granules, no visible excess of unsplit or split fats, and hence no evidence of external pancreatic deficiency. Their chemical content is described below.

Menstruation was normal and regular before and during 1936–37; hence gonadal or pituitary upset of sex function was not a primary feature. In 1938 menstruation came on only every 3–4 months. In 1939 only three periods were missed, but for three years, since February, 1940, there had been no menstruation. Her strong muscularity and general thinness suggested masculinity, but the urinary androsterone was normal at 8·7 mg. per 100 ml. The distribution of hair remained of the feminine type, and in my opinion the severity of the diabetes or metabolic disturbance was alone sufficient to produce the amenorrhœa.

Fig. 3—Condition of patient in 1938, showing surface-markings of liver and spleen.

The *blood-picture* was essentially normal except for an increasing lymphocytosis, which reached 57% of the total 5000–8000 white cells per c.mm. (polymorphs 32%). She belonged to group N. The platelets, red-cell fragility, and clotting-time were normal, and a sternal puncture undertaken to exclude Gaucher's disease showed a normal marrow. Analyses of all the organic and inorganic chemical elements, including the proteins, carotene, diastase, and phosphatase, were within normal limits. The Wassermann reaction was consistently negative, but the sedimentation-rate was persistently high from 1938 onwards—i.e., 67–80 mm. in the first hour.

Radiography of the entire bony system, including the sella turcica, showed no abnormality, and the skin and mucosæ showed no abnormal pigmentation. After seven years of excess of blood-sugar and blood-cholesterol no arteriosclerosis or retinal hæmorrhages developed.

The *parotid* glands were enlarged and hard since 1938, becoming more obvious as lipodystrophy developed, and I felt that their prominence might be explained by the lipodystrophy. Later the palpable parts of the parotid and the submaxillary glands were stone-hard; hence pathological change became certain. A sialogram showed no obstruction, and the changes found at biopsy are detailed below. This biopsy was primarily undertaken in the hope of throwing some light on possible changes in the pancreas, the two glands being structurally similar. Although the secreting alveoli were almost completely replaced by duct tissue, saliva was still secreted. Chemical tests showed the presence of thiocyanate, and sufficient ptyalin was present to hydrolyse a starch solution fairly rapidly.

Pathological report (February, 1940): "The *parotid* gland is extensively infiltrated with lymphocytes and a few plasma cells. Secreting acini are practically absent and have been replaced by proliferated ducts, some of which show dilatation. A little fat could be demonstrated in the cells lining the ducts and free in the duct lumina, but fat storage is undoubtedly not responsible for the enlargement of the gland. The histological appearance suggests that this is due to blockage of the secretory ducts. The evidence for blockage of the secretory duct, however, seems sketchy and presumably rests on the apparent atrophy of gland acini. The *skin* excised from the parotid region shows no abnormality, but no subcutaneous fat can be seen."

The *lymph-glands* in general were slightly enlarged and firmer than normal, and an inguinal gland showed the following histology (1940): "The lymph-gland shows reactive hyperplasia with proliferation of sinus endothelium, and there is also a considerable amount of central fibrosis. Fat can be seen in the blood-vessels, and a little has been stored in the reticulum cells and histiocytes of the medulla of the gland and in some of the sinus endothelial cells. Fat storage, however, seems to be coincidental with the lymph-gland enlargement and not responsible for it. The section of the *skin* shows a normal amount of fat in the cells of the *sebaceous* glands, but no subcutaneous fat can be seen."

Type of Lipodystrophy.—Her appearance was the only feature of her illness which distressed the patient and drove her out of employment to shelter in hospital. This feature was not obvious on diagnosis in 1936, but it was noted five months later that, although weight had been gained, "the face remained thin." This leanness spread and became more striking, and by 1939 a complete absence of subcutaneous fat in the face, neck, and shoulder girdles had developed, accompanied by a thinness everywhere (fig. 4). This is very different from the usual type of lipodystrophia progressiva in women, in which only the upper parts waste and the lower trunk and legs remain well nourished or even obese. Although her atrophy started in the face, she never had a compensatory excess of fat below. The unusual feature of her type was not the facial atrophy but the ultimate complete absence of subcutaneous fat, confirmed by biopsy and later at autopsy. Lipo-atrophy would be a more accurate term for her ultimate condition. At no stage did she show any localised insulin fat-atrophy.

METABOLIC DISTURBANCES

It is probably misleading to deal with the various metabolic disturbances separately, as they clearly react on each other, but for purposes of description they will be considered under the headings of carbohydrate, lipoid, and general metabolic upsets.

Carbohydrate Disturbance.—The diabetic condition appeared quite ordinary at first and responded completely to some 20 units a day when first treated in 1936. It soon required 50 units a day to obtain the same control, a fairly average dose for a diabetic of this age, working and probably indulging in some irregularities in diet. The insulin requirements gradually increased and were kept at 140 units a day in 1938 and 1939, while the effect of many variations in diet was being studied, without obtaining any full control of the diabetes.

In 1940, on a diet of carbohydrates 300 g., proteins 70 g., and fats 100 g. (glucose equivalent 350 g.), 400 units of insulin was given daily for some months; and, although a positive carbohydrate balance was maintained, an excretion of as much as 150–250 g. of glucose was found with an average glucose/insulin equivalent of about 0·5 g. per unit. Insulin, however, was not without effect; for, when all injections were stopped—with some trepidation—the glucose excretion rose to over 300 g. (still slightly positive total glucose balance) and the hyperglycæmia to more than 500 mg., thirst and polyuria became intense, and 10 lb. was rapidly lost in weight, which was soon regained on resumption of insulin.

An intravenous insulin-sensitivity test (Himsworth) showed evidence of this; and, although the arterial sugar curve rose as it should not do in a truly insulin-sensitive case, the venous sugar fell steeply 15 min. after insulin and showed a strong effect of insulin in the peripheral use of sugar. In all circumstances, too, the high fasting blood-sugar was reduced to a considerably lower level some four hours after a dose of insulin. Later, insulin was given intravenously to see if it would act more powerfully, and the following typical result shows a decided but brief depression of blood-sugar after 120 units of insulin followed by breakfast containing 65 g. of carbohydrate:

	Insulin 120 units I.V.						
	Fasting ↓	½	1	1½	2	2½	3½ hr.
Blood-sugar	520	434	363	324	370	356	392 mg. per ml.

No anti-insulin substance could be demonstrated in the patient's plasma by insulin-depression curves on rabbits. These were carried out in 1939 and 1941 by the very thorough technique of Gray and Oakley (1946), whereby 60 ml. of plasma is injected over four days and two depression curves are done after 0·2 unit of insulin given intravenously. A course of œstrogen (stilbœstrol 2 mg. four times a day) made no difference to her insulin requirements. While she was on doses of 400 units a day, no excretion of insulin was observed in her urine as tested by a technique capable of estimating 0·5 unit in 100 ml. of urine (Cutting 1942).

Since the patient's main anxiety was to gain weight to cover her distressing facial appearance, she was put on a very high diet: carbohydrate 300 g., protein 120 g., fats 200 g. (3500 calories), with 100 units of insulin b.d., without any attempt fully to control the diabetes. On this she gained 14 lb. and felt energetic and happy, although excreting 150–200 g. of sugar a day.

In November–December, 1940, it was decided to see how much insulin was necessary to control the diabetes on this diet, and what its effect would be; 120 units, later 160, was given four times a day, and later eight times a day, with the result that the blood-sugar fell to about 200 mg. per ml. and the amount of glucose in the urine to 80 g. a day. Ultimately insulin was given three-hourly day and night, 320 units when the urine contained much sugar, 240 when traces were present, and 160 units when the urine, tested three-hourly, was sugar-free.

For ten days a minimum of 1680 and a maximum of 2160 units was given on this ruling, and no hypoglycæmia developed, but the sugar excretion fell to some 15 g. a day. After an unexplained attack of fever (temp. 102°–104° F) hypoglycæmia developed, although all the diet was eaten, and the insulin had to be reduced to some 600 units. For the next month 1000–1600 units daily sufficed to keep the blood-sugar normal and the glucose in the urine at 0–10 g. a day, and to our surprise the lipæmia disappeared and the blood-cholesterol level became normal.

The dietary carbohydrate was then cut from 300 g. to 120 g. to make sure that the full utilisation of 300 g. had not caused the disappearance of the lipæmia, and now 700 units a day controlled the diabetes, and the lipæmia still remained absent. Next the carbohydrate was raised again to 300 g., and the insulin requirement rose to some 1100 units. Then the insulin was much reduced to allow a diabetic relapse, but this did not become heavy (100–150 g. of glucose in the urine a day) until the insulin was reduced to a very low level, 80 units a day. On this lipæmia rapidly recurred, 3–4%, and was not lowered by the substitution of vegetable for animal fat or by the reduction of the dietary fat from 200 g. to 70 g. a day. Again, in December, 1941, a lipæmia of 6% was abolished by raising the insulin from 240 units to 640 units a day, which fully controlled the diabetic state at that time.

Throughout these observations it was clear that the carbohydrate intake directly affected the glycosuria and the amount of insulin required to control it, but changes in the fat-intake from 100 g. to 10 g., and later from 200 g. to 70 g., showed no influence on the diabetic condition as judged by the sugar excretion or glucose/insulin equivalents. It was clear too that although unusually high doses of insulin were necessary they produced quite usual effects on blood-sugar and weight.

Ketosis, usually the surest indication of a severe diabetic condition, has been strikingly absent in this case. This was most clearly seen in May, 1940, when the effect of suddenly stopping 400 units of insulin a day was watched, on a diet of carbohydrates 300 g., proteins 60 g., and fats 10 g. All other cases of "diabetes" I have observed would have rapidly developed intense ketosis and plunged into diabetic coma. This omission of insulin changed a positive carbohydrate balance of +200 g. to a negative balance of −28 g., but Rothera's nitroprusside test remained negative (if the glucose from the protein is calculated, the total carbohydrate balance was positive by some 5 g.). When, however, the carbohydrate balance was made more negative (−55 g. of glucose) by reducing the dietary carbohydrate from 300 g. to 120 g., Rothera's test became strongly positive, but the ferric-chloride test remained negative. Next the carbohydrate was put back to 300 g., and the ketosis fell to minimal traces and was not appreciably increased by an increase of fat to 100 g. and later to 200 g. a day in spite of a heavy lipæmia. On three other occasions when the diabetes was specially uncontrolled (once during a dental abscess and a simultaneous emotional upset), a transient severe ketosis developed. On another occasion, during

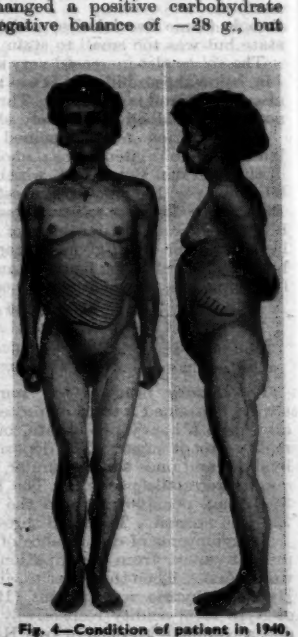

Fig. 4.—Condition of patient in 1940, showing surface-markings of liver and spleen and the lipodystrophy.

a B.M.R. test with no insulin for sixteen hours, a transitory ketosis was present.

The ketosis never had any direct relation to the degree of lipæmia. It seems clear that ketosis could be produced by a heavily negative carbohydrate balance, but with much greater difficulty than in most diabetics or even normals. Ketone bodies are known to be produced entirely in the liver, and it may be that her enormous liver had lost the power of catabolising fats to ketones, or more likely that she had no depot fat to mobilise.

Lipoid Disturbance.—A xanthomatous rash was the presenting symptom, and cholesterolæmia and lipæmia were noted from the beginning and were continuously studied since 1936. At first the total blood-fat was estimated by the lipocrit, but from October, 1938, Dr. C. H. Gray carried out many complete analyses of the total and individual blood lipids (two are included in table II). In brief, these showed a general and parallel rise and fall in all the lipoid constituents of the blood and a normal free/ester cholesterol ratio. The highest lipæmia, recorded on July 1, 1940, was 8·175 g. per 100 ml., the lowest 0·985 g. per 100 ml., on Feb. 13, 1940, with simultaneous cholesterol figures of 687 mg. and 125 mg. per 100 ml. respectively. It became clear from his studies that the appearance of the plasma and an estimation of cholesterol gave an accurate enough index of the degree of lipæmia without complete chemical analysis (impossible for a period when his laboratory was bombed). Slight lactescence of the plasma was noted when the total lipids were 1·5–2%, obvious milkiness when 2–3·5%, and a heavy cream settling out at higher figures. Lipæmia retinalis was infrequently present, being slight at first and recurring for a few days in April, 1940, with 5·5% lipæmia. The critical retinal level appeared to be about 5%.

The widespread papular xanthomatosis already described rapidly disappeared after treatment and never recurred in an overt form. At times, when high grades of lipæmia persisted for a week or two, a few papules developed in the upper arms, but so small as to be more easily felt than seen. Temporary changes in the size of the liver and spleen in relation to the lipæmia were difficult to be certain about. The gradually enlarging spleen certainly showed no appreciable change in size or consistence with varying lipæmia, and the liver no clear recession during times when the lipæmia was kept low for weeks on end.

It was not until February, 1941, when the diabetes had been controlled for three months by enormous but varying doses of insulin, 1000–2000 units a day, that it was fully realised that the lipæmia depended essentially on the degree of diabetic control. The amount of carbohydrate metabolised, whether 120 g. or 300 g., made no difference, and there was no lipæmia when the blood-sugar concentration was normal, and hyperglycæmia invariably produced lipæmia. It was proved too that there was no fixed dose of insulin which always prevented lipæmia, but a variable dose which at the time controlled the hyperglycæmia.

Relation of Lipæmia to Dietary Fat.—Before the above relation of lipæmia and hyperglycæmia was appreciated, the effects of different kinds and qualities of dietary fat were studied for long periods. For five months in 1938 the patient heroically followed a diet containing only some 10 g. of fat a day, in which skimmed milk, fatless fish, and a very occasional egg supplied all the protein. The lipæmia remained low for her at not more than 2% and the blood-cholesterol level about 200 mg. per 100 ml.

At other periods only vegetable fat (pure hydrogenated nut oil) was given on the assumption that it might be metabolised differently and because it is said to be lacking in the type of sterols which can elevate the blood-cholesterol level (Thannhauser 1940a). These different types and amounts of fat seemed to moderate the lipæmia; but, looking back, it is clear now that the reduced lipæmia coincided with periods of relatively good diabetic control and certainly depended on the blood-sugar level. There is no clear evidence that variations in either the fat-intake from as little as 10 g. to as much as 200 g. a day or the type of fat made any fundamental difference to the grade of lipæmia. I am sure they did not.

Both choline and lipocaic † were given separately and in full doses for six weeks, but neither showed any influence on the lipæmia or size of the liver and spleen.

In May, 1940, Prof. A. C. Frazer and Dr. H. C. Stewart kindly attempted to study the lipæmia by their method of lipomicron counts (Frazer and Stewart 1937, 1939) in this patient's serum. It was intended to study the effect of fat-meals, &c., by this method, which is much easier than chemical analyses; but the high-grade lipæmia made this technically impossible through clumping of fatty particles.

Absorption, Excretion, and Metabolism of Fat.—There has never been any clinical evidence of fatty diarrhœa or microscopical or chemical evidence of lack of absorption of fat from the gut. Fat-analyses of the dried fæces showed a normal percentage of total fat and a normal proportion of split to unsplit fat. Positive evidence too of fat-absorption was obtained in 1938, when the lipæmia rose from 2·2% to 5·2% three hours after a meal containing 70 g. of fat.

Studies of the respiratory quotient after fat-meals were undertaken to obtain evidence of ability to burn fat, but only indefinite and irregular results were obtained. This patient always showed a very variable respiratory quotient in the fasting condition (0·69–0·92), a finding which is common in severe diabetics on soluble insulin.

Protein Metabolism and Nitrogen Balance.—The protein in the diet was changed very little, and no studies were made on any special effect of protein on her condition. Up to July, 1940, her protein intake was 70 g. a day, after this 120 g., which continued for two years. This latter high amount was given partly to satisfy her large appetite and partly to help to fatten her, her only ambition.

The nitrogen balance was strongly negative in January, 1939, when with an intake of 10 g. she excreted 23, 19, and 16 g. on consecutive days. At this time her diet was low, her calorie intake only 1200 a day, whereas her expenditure (B.M.R. +58) was 2160 calories, and this probably explained the loss of nitrogen. Later, when on a very high calorie diet (December, 1940) with 1500 units of insulin a day and a well-controlled diabetes, the nitrogen balance was found to be positive by +2 g. a day.

High Metabolic Rate.—One of the most striking and puzzling features was the extremely high B.M.R. She *never showed any signs of Graves's disease*, and a high metabolic rate was not suspected and only discovered (+58) in December, 1938, during experiments on the respiratory quotient. It is unlikely that the metabolism was raised in 1936, because the pulse-rate was 70, the pulse pressure 40 mm. Hg (B.P. 110/70), and so the rise coincided with the full development of her syndrome. The B.M.R. has risen much higher, figures of over +150 being obtained on several occasions, and the clinical signs of this were clear: an enormous appetite, sweating particularly after meals, pulse-rate 90–100, pulse pressure 50–70 mm. Hg, and a temperature often above 99° F, but under 100° F. The thyroid gland seemed occasionally over-firm and slightly enlarged but was mainly normal to palpation; but there were no cardiac irregularities (although the conus arteriosus was dilated), no nervous or temperamental symptoms, and no eye symptoms or tremors.

At first the B.M.R. was estimated with the Benedict-Roth machine and calculated on Sanborn's figures. After the war necessitated its evacuation to our main country hospital, sometimes the patient went there for a special test, but more often the B.M.R. was done in London with a Douglas bag and Haldane apparatus. Although the patient was a perfect subject and the technique satisfactory, except when the Haldane apparatus suffered from blast on two occasions, wide variations were found in the estimations, such as +80% and +140% within two weeks of each other, for no obvious reason. Dr. J. D. Robertson, of the Middlesex Hospital, kindly checked our results, and, at a time when the patient was under iodine, obtained two figures of +81% and +83% on consecutive days, while our estimation showed +80% in the same week. I am satisfied that the irregularities observed are true estimations, but cannot explain them and merely point out that considerable unexplained variation occurred also in the diabetic condition of this mysterious patient. On the other hand, changes in the lipæmia and/or diabetic control had no observable effect on the B.M.R.

Iodine, however, had a clear though temporary effect in lowering the B.M.R. Ten minims of Lugol's iodine t.d.s. was given continuously for two months in August and September, 1940. Before administration the B.M.R. was +146 and +147; after two weeks' iodine +123 and +128; after seven weeks +81 and +80. After iodine was omitted, the B.M.R. rose again, but how soon I do not know, as the serious day and night bombing at this time interfered with such work. A month afterwards, however, the figure was +140. During this period of iodine the patient felt better and sweated less, the pulse-rate fell slightly, and the thyroid was perhaps softer and smaller. At her own request she resumed iodine later on

† I wish to thank Messrs. Boots Pure Drug Co. Ltd. and British Drug Houses Ltd. for preparing the lipocaic.

and was on 10 min. t.d.s. continuously for many months before thyroidectomy, and the B.M.R. ran between +120% and +150%.

Thyroidectomy was undertaken in June, 1942, with no clear preconception of what would result. We were encouraged by the patient's adventurous attitude. She was tired of her condition and long stay in hospital and had seen dramatic improvement in thyrotoxic diabetics from the operation.

For some weeks before operation the patient had been on too little insulin, 160 units a day, had lost much weight, and from this and bronchiolitis was intensely lipæmic (cholesterol 770 mg. per ml.). This was corrected by 960 units a day (given four-hourly) and the patient brought to the theatre with a normal blood-sugar, no ketosis, and a reduced lipæmia, and still on 30 min. of iodine daily.

Mr. John Hunter removed the thyroid almost totally, and the recovery phase was fairly smooth. For a few days after operation the patient was somewhat sick and unable to eat even all her carbohydrate, and the insulin had to be reduced to 160 units a day, but quickly rose to 360 units again. During this phase an optimistic house-physician thought the liver smaller and softer, but I remained sceptical. As time went on, it became clear that thyroidectomy had made no difference to her general organic condition or to the diabetic or lipoid metabolism. The effect on her metabolic rate, however, was clear and interesting.

After operation the B.M.R. gradually fell until it reached +38% at the twelfth week. She gained 27 lb. and gradually developed a painful stiffness in all her muscles which became intolerable. The girth of the calf was increased (fig. 5), and the electrical reactions to a single galvanic stimulus showed a slower contraction and a more prolonged relaxation than normal muscles. There were no obvious subcutaneous or skin changes, and no noticeable changes in the hair, voice, or pulse-rate; but it seemed clear that she was developing symptoms of hypothyroidism, although the B.M.R. was so much above normal. The metabolism was raised to +65% by giving thyroid gr. 2 a day, and the pains were alleviated. But it required gr. 3 to make her feel quite well, and this restored her B.M.R. to +100%. She remained on this dose and at this metabolic level during the succeeding year. For the last six months of her life she felt in excellent health and had returned to full-time employment as a telephonist. She took 640 units of insulin a day, never had hypoglycæmia, and remained vigorous in spite of a constant lipæmia, considerable hyperglycæmia, a huge liver and spleen, and a complete absence of subcutaneous fat.

The following is the section report of the thyroid:

"Many nodular areas of hyperplasia throughout the gland, showing small and irregular acini lined by high columnar epithelium, often forming papillary projections. In such areas the smaller acini are mostly empty, and the larger ones show absorption of colloid. Foci of lymphocytic infiltration are associated with many of these areas, often showing the formation of lymphoid follicles. The acini of the intervening areas are large, well filled with colloid, and lined with flattened or cuboidal epithelium. The stroma is increased in amount and density, producing well-marked lobulation. *Frozen sections* do not show any abnormal intracellular deposits of fat. One or two lipoid-filled macrophage cells are present in a few of the acini, and the blood-vessels are rendered prominent in virtue of the high lipoid content of the plasma."

Fig. 3—Condition of legs in myxœdematous stage following thyroidectomy.

Although the histology shows a few areas of overactivity, such as are found in Graves's disease, it seems unlikely that this is the primary cause of her raised metabolism, and the sequence of events after thyroidectomy bears this out. Her usual high rate of metabolism, +100%, was reduced by operation, as one might expect, and she became "myxœdematous" at +40%, to return to her previous "normal" level when sufficient thyroid was given. It seems certain that her B.M.R. was not primarily due to thyrotoxicosis and was more akin to the increase found in leukæmia. I do not know whether the thyroid shows histological changes in leukæmia, or whether a raised B.M.R. per se can produce secondary reactive changes in the gland similar to those of thyrotoxicosis. I can find no published evidence on this point.

The highest B.M.R. figure obtained was +177%, and many readings have been over +140. These seem to constitute records, as the highest figures I can find mentioned are +129 in primary toxic goitre (Joll 1932) and +123 in leukæmia (Grafe 1923).

Calcium Balance.—A study of calcium balance was undertaken primarily at the suggestion of Dr. Robertson, to afford evidence on the presence of thyrotoxicosis, because Aub et al. (1929) have demonstrated that in Graves's disease, on a low intake of calcium, there is an increased total loss of calcium from the body, chiefly in the urine, and that the normal ratio of urinary : fæcal loss of calcium is reversed. Dr. C. H. Gray carried out the balance over a period of six days at a time when the patient's B.M.R. was +138%. On a daily intake of 140 mg. of calcium the average urinary output was 55 mg. (range 53–57 mg.), the fæcal loss 370 mg. per day (range 1450–780 in three-day periods), showing a negative balance of 280 mg. a day and a urinary : fæcal calcium ratio against thyrotoxicosis.

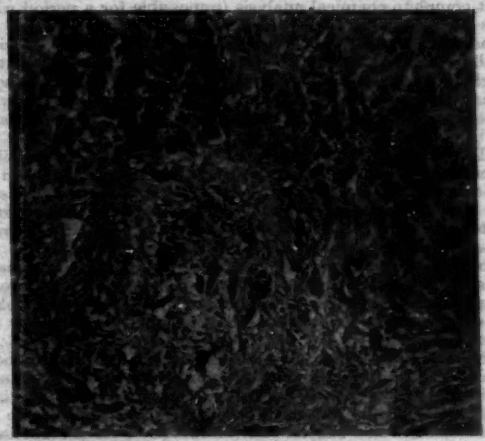

Fig. 4—Section of liver, showing portal cirrhosis. (×150.)

TERMINAL ILLNESS

In August, 1943, though still in vigorous health and full employment, the patient complained that her abdomen was uncomfortably fuller. The liver and spleen seemed the same, but a new cystic swelling was felt near the bladder. This enlarged rather rapidly and by October was diagnosed as a large ovarian cyst.

Our doubts about operation were finally decided by intolerable abdominal distension, and in December two large bilateral ovarian cysts and the appendix were removed by Mr. John Peel at laparotomy. The cysts were simple serous cysts lined with low columnar epithelium, with a few shallow invaginations into surrounding dense fibrous stroma. (At operation biopsy material from liver, spleen, pancreas, and muscle was obtained in a normo-lipæmic phase and is described below.) After operation great difficulties arose from pain, and vomiting was frequent, but her usual carbohydrate was administered, often intravenously. The insulin requirements fell greatly, and on some days as little as 80 units kept the urine completely sugar-free. The abdominal tension stitches would not hold, the wound gaped twice and became infected, and serious hæmorrhage occurred. The urine too became heavily infected with *Bact. coli* and enterococci, and in spite of blood, saline, and glucose transfusion she died suddenly three weeks later, after a few days' pyrexia

Fig. 7—Section of lymph-gland. (×75.)

Fig. 8—Section of lymph-gland. (×300.)

of 103° F with rigors. Only 40 units of insulin was given at 8 A.M. that morning, after which she had taken glucose drinks well. The blood-sugar at noon was only 53 mg. per 100 ml. This may have contributed to her death at 5 P.M., but 60 g. of glucose was given intravenously at 2 P.M. without any recovery from increasing unconsciousness. I have seen a similar reduction of insulin requirements in other diabetics at the ebb of life.

AUTOPSY AND BIOPSY FINDINGS

Both living and postmortem specimens were obtained in a state of minimal lipæmia. The tissues for glycogen analyses were obtained an hour after death, and the autopsy was performed seventeen hours later, with intervening refrigeration.

General condition: there was a complete absence of subcutaneous, intra-abdominal, and perinephric fat. Unfortunately I stupidly omitted to have the marrow examined for fat. A generalised hard enlargement of *lymph-glands* was present everywhere, including the groins and neck. Large masses of these glands were found in the mediastinum, para-aortic areas, and mesentery, and on both surfaces of the diaphragm, and very large masses pressed on the head and half the tail of the pancreas. They were homogeneous and pinkish on section. The blood was not obviously lipæmic. There was no free fluid in the serous cavities, no peritonitis, and very little inflammatory reaction round the abdominal wound. The abdomen was three-quarters filled by the huge liver and big spleen.

The *liver* was enormously and uniformly enlarged and weighed 5057 g. (normal for her weight, 1650 g.‡). It was fibrotic, brownish, and did not look fatty. Microscopy § showed a well-marked portal cirrhosis (fig. 6), with considerable deposition of fibrous tissue along the portal tracts and infiltration with inflammatory cells, chiefly lymphocytes with a few mononuclears. There was proliferation of bile canaliculi. The polygonal cells of the liver appeared normal, and the liver cells contained no obvious excess of fat. Kupffer's cells showed no abnormality.

The biopsy material showed similar appearances, except that the liver cells contained more fat. Alcohol-fixed material (Best's carmine stain) proved the cells to be richly filled with glycogen.

The *spleen* was also enormously enlarged and weighed 1207 g. (normal 175 g.). It was slightly tough and showed perisplenitis over the lower pole. The sections showed little abnormality. There was no proliferation of the malpighian corpuscles. The sinuses were clearly seen and were filled with blood. No "foamy" or lipoid-containing cells were present. The piece removed during life showed similar appearances, except that the outlines of the sinuses were less clear, and they contained much less blood.

The *pancreas* was normal, apart from partial compression by masses of enlarged lymph-glands. Ordinary sections showed nothing abnormal, but special staining for granules was not undertaken. The piece removed at biopsy proved to be part of an enlarged gland.

The *kidneys* were enlarged and weighed 653 g. (normal 290 g.). They were normal in appearance and consistence, and the only abnormality found on section was an occasional partially or completely hyalinised glomerulus. There was no perinephric fat.

The *heart* was generally enlarged and weighed 341 g. (normal 260 g.). The muscle was good and normal microscopically. The mitral valve showed slight sclerotic thickening, but the coronary arteries were healthy, and aortic atheroma was minimal.

The *endocrine* glands were normal macro- and microscopically. Only remnants of the thyroid were present; the pituitary was normal, and the suprarenal showed only some interstitial infiltration, with vacuolated eosinophil material.

All other organs were normal, and the *enlarged lymph-glands* alone are of special interest in their unique appearance.

Para-aortic gland: the lymph sinuses both at the periphery of the gland and in its substance are widely dilated and filled with faintly eosinophil hyaline material containing vacuoles, which in places are so numerous as to give the eosinophil material a reticulated appearance. This material probably represents lymph in which were many fatty globules of various sizes. Besides this distension of sinuses, the whole gland appears œdematous. Distributed in the gland and particularly in the subcortical zone are rounded or irregular collections of lymphocytes about the size of normal lymph follicles, though devoid for the most part of any central collection of reticulum cells. The remainder of the gland is largely occupied by cells of irregular outline, with vesicular nuclei and bulky vacuolated cytoplasm (figs. 7 and 8). These probably represent the pulp reticulum cells, with many fat globules in their cytoplasm. The lack of frozen sections makes it impossible to be certain of the nature of the vacuoles in either of these situations.

The *œsophageal glands* and the *gland from the head of the pancreas* show similar changes, but the area occupied by the collections of normal lymphocytes is larger. The biopsy material of the *mesenteric glands* shows similar distension of the lymph sinuses, both peripheral and central, with vacuolated eosinophil material. The distension of sinuses within the gland is very variable but in some parts extreme. The cells with bulky vacuolated cytoplasm in the pulp are less conspicuous and numerous than in the postmortem material. Another gland from the neighbourhood of the pancreas shows little distension of sinuses but much overgrowth of the reticulum type of cell in some parts of the pulp. In none of the lymph-nodes is there any obvious proliferation of lipid-containing histiocytes.

Glycogen Analyses of Postmortem Material.—Samples for glycogen analysis were collected an hour after death. I can find practically no similar analyses but give for comparison figures obtained by Manton and Lowman (1943) from a normal infant, aged 14 months, eight hours after death, and some from a case of glycogenosis as a contrast (table 1).

‡ The normal weights of organs are the averages given in Vierordt's tables (1906) for her sex, age, and weight.

§ I am greatly indebted to Dr. E. H. Creed, our pathologist, for the microscopical reports.

It seems probable that the patient's tissue glycogen was normal. At least we know that biopsy material showed an abundance in her liver, and this was not fixed but disappeared rapidly and normally after death.

Published fat-analyses of the internal organs are too rare to establish any valid normal standard, but the figures given in table II seem to be at the upper limit of normality. At any rate it is clear that the internal organs were nearly normal in their fat-content in contrast to the excess in the blood and the deficiency of stored fat. Fat analysis of the brain gave the following figures:

Cholesterol	=	2·5 g. per 100 g. fresh material
Phospholipid	=	4·5 " " " " "
Cholesterol/phospholipid	=	1·8 " " " " "
Free cholesterol / Total cholesterol × 100	=	90

Comparable Syndromes and Cases

It is a sound principle to assume that a diseased condition like the above, however diverse its manifestations, is due to one primary pathological process unless the contrary is clearly proved. This case does not fit into any recognised pattern of physiological disturbance or pathological syndrome, but there are comparable syndromes and one or two almost identical cases. It is, however, far easier to say what this case is not than what it is.

TABLE I—COMPARISON OF GLYCOGEN ANALYSES

Tissue	Glycogen (mg. per 100 ml.)		
	Present case	Manton and Lowman (1943)	Glycogen disease
Liver	84	100	14,000
Heart	40	70	2500
Kidney	64	60	100
Striped muscle..	286	..	..

Diabetes with Lipæmia and Secondary Xanthomatosis.—The occurrence of lipæmia, hypercholesterolæmia, and xanthomatosis has been occasionally observed in diabetes, particularly before the use of insulin, and I have myself treated 4 cases in which blood and retinal lipæmia and skin eruptions have been quite as well marked as in the present case. All these cases, and many described by others, had severe associated ketosis, and these abnormal aspects of fat metabolism rapidly disappeared on treatment with adequate carbohydrate and insulin. It is now accepted that such a condition is brought about by the excessive mobilisation and utilisation of fat to compensate for the poor utilisation of carbohydrate in severe diabetes. The lipæmia usually disappears in a few days, the cholesterolæmia in a few weeks, and the skin lesions in 2–3 months, and do not reappear whatever the diet—even if hyperglycæmia is permitted—so long as adequate carbohydrate and insulin are given to abolish ketosis. The liver under such conditions may be somewhat enlarged at first and in my experience the spleen also. Similar temporary disturbances are occasionally seen in diabetic children poorly controlled for long periods; but the lipæmia is never gross, and xanthomatous manifestations are absent.

Hypercholesterolæmic Splenomegaly in Diabetes.—If the above-mentioned condition is not reversed by treatment and goes on long enough—and before the introduction of insulin it went on to death in coma—the spleen may become enlarged and then contains from the accumulation of cholesterol esters or some closely akin lipoid in the reticulo-endothelial cells, the so-called "foam-cells," very like the cells found in the Gaucher and Niemann-Pick types of splenomegaly. Such splenic enlargement was first described by Coats (1889), and similar cases have been recorded by Schultze (1912) and Oppenheimer and Fishberg (1925). In some but not all cases the liver also is enlarged. The present patient clearly does not fall into this category, for her spleen contained no foam-cells, and ketosis was strikingly absent.

Lipæmia and Xanthomatosis in Chronic Pancreatitis and Liver Disease.—Several rare and little-understood cases may be grouped together under this heading. Thannhauser (1940b) describes the rare condition of *xanthomatous biliary cirrhosis* characterised by cholesterol deposits in the biliary tracts. He also describes a group where lipæmia is associated with chronic pancreatitis, with characteristic intermittent attacks of abdominal pain and fever. From such cases the interesting suggestion has been made that the pancreas has, besides its antidiabetic function, an internal secretion with an antilipæmic action concerned with fat-metabolism. Eusterman and Montgomery (1944) discuss an interesting series of lipæmic cases with jaundice which are difficult to classify. None of these has any clear connexion with the condition I have described.

LIPODYSTROPHIES WITH METABOLIC DISTURBANCES

There is no satisfactory classification of the lipodystrophies or clear knowledge of their underlying ætiological factors. Various rather confused theories of local, general metabolic, endocrine, and autonomic nervous system disturbances have been advanced to explain lipodystrophy, and the evidence for various views is discussed by Harris and Reiser (1940). The lipodystrophies are rare, and complete lipo-atrophy extremely so. The commonest type is partial, in the upper part of the body, and is accompanied by such lipo-hypertrophy in the lower parts that the total deposition of fat is not reduced, and the condition is unlikely to affect lipoid or general metabolism. Some cases, however, are recorded with disturbances of carbohydrate, fat, or basal metabolism.

Cohen and Eis (1934) describe two women of menopausal age, one with +44 B.M.R. unaffected by thyroidectomy, and another with +70 B.M.R. (operation refused) who had cholesterolæmia and a raised blood-sugar. The case reported by Decourt et al. (1936) showed blood-fat 1·25%, total cholesterol 330 mg. per 100 ml., and B.M.R. +20, but no sugar disturbance.

Hansen and McQuarrie (1940) have published the clinical and pathological details of an extraordinary case of a boy (fig. 9) very similar to the present case.

At the age of 4 years this boy was admitted to hospital with complete lipodystrophy and a moderately enlarged liver, having become thin after an attack of jaundice at the age of 3 years. No endocrine or blood abnormalities except a slightly diabetic glucose-tolerance test were present at first. Next year he developed frank diabetes, which persisted until his death at 9 years. He grew well but never regained fat. Like the present case he was insulin-resistant, requiring up to 280 units a day, and he also never showed ketosis. Ultimately he died, with progressive cirrhosis and a very large liver and spleen, from associated gastric hæmorrhage. In the terminal stages the level of neutral fat in the blood, at one time reported as above normal at 1500 mg. per 100 ml., fell to the very low figure of 51 mg. per 100 ml. At

Fig. 9—Hansen and McQuarrie's (1940) case of lipohistiodiaresis (from Irvine McQuarrie's "The Experiments of Nature and Other Essays," Kansas, 1944).

TABLE II—FAT-ANALYSES OF PLASMA (g. per 100 ml.) AND OTHER TISSUES (g. per 100 g. of fresh material)

—	Plasma		Liver	Spleen	Kidney
	Min.	Max.			
Total lipids	0·985	8·175	3·290	2·10	2·32
Glyceride	0·504	6·430	2·270	0·902	1·113
Phospholipid	0·200	0·799	0·658	0·650	0·512
Free cholesterol	0·048	0·344	0·230	0·231	0·372
Total cholesterol	0·125	0·687	0·302	0·412	0·555
Free cholesterol / Total cholesterol × 100	38	50	76	56	67

autopsy no significant pathological changes were found except portal cirrhosis, but neutral fat was completely absent from the skin and the perinephric tissues and scanty in the liver, whereas the cholesterol and phospholipids were normal. Hansen and McQuarrie suggest the word "lipohistiodiaresis" (lack of fat in the tissues) as a descriptive term, suggest that there was a highly selective disturbance in the lipid-regulating function of the liver, and consider that the curious diabetes offers some evidence in favour of abnormal conversion of fat into carbohydrate. Here is a "diabetes" very like that of the present case.

Another case of lipodystrophy described by Ziegler (1928) shows metabolic disturbances *almost identical* with those found in my case, and the full details published merit close study but must be abbreviated here. A woman, aged 27, never robust, was admitted in 1925 to the Mayo Clinic with swellings over the body for two years and well-marked general weakness for three years. At 11 years of age tender swellings appeared on the legs and thighs for two to three weeks, and these were followed by complete loss of all subcutaneous fat in the lower extremities. After marriage at 22 she soon became pregnant, and three months after delivery her face became swollen and hard, and erysipelas was feared. These swellings disappeared in another three months and with them all the subcutaneous fat in the upper part of the body. After this she noted swellings of the glands for a time, and large brown itching areas appeared all over the skin. She began to have epigastric soreness, and the liver and spleen were enlarged and became huge within a few weeks. Thirst and polyuria developed at this time, and heavy glycosuria was discovered.

Investigation in the Mayo Clinic showed the following picture and no other important abnormalities. Complete lipodystrophy was confirmed, and the brown pigmented skin areas were labelled tinea versicolor. Both liver and spleen reached to the umbilicus and were soft, compressible, and not tender. The urine contained "+2" albumin, 4·6% sugar, but no ketones, and the sugar was easily controlled by restriction of diet without insulin. The blood-sugar was 130 mg. per 100 ml., but whether before or after treatment is not stated. The B.M.R., estimated six times, varied between +40% and +57%, but the thyroid gland was not enlarged. Iodine had no influence on the metabolic rate, which, after subtotal thyroidectomy, remained at +50 to +59%. The pathologist's report was "colloid and fœtal thyroid with extensive interacinar hyalinisation." From all this it is certain that thyrotoxicosis was absent. Slight enlargement of all palpable lymph-nodes is recorded and one excised gland was labelled briefly as "inflammatory." She was discharged in much the same condition. I wrote to Dr. Russell Wilder in 1940 for further details, and his kind reply stated that all they knew was that she gave birth to a living child in 1930 and died in 1936. Xanthomatosis was not present, nor any gross lipæmia, which would not have been missed in repeated blood-tests.

Apart from visible lipæmia, therefore, Ziegler's case is identical with the present case, and, because I wish to show that the condition I have described is not an isolated freak but has a tangible metabolic lesson, I venture to argue how Ziegler's lipodystrophic case might have a similar disturbance of fat-metabolism without an obvious lipæmia.

The sudden enormous enlargement of liver and spleen with simultaneous heavy glycosuria was almost certainly due to engorgement with fat, and this may have removed any obvious accumulation of fat in the blood. Such a happening is supported by a report by Holt et al. (1939) of a child with "familial idiopathic lipæmia" in whom recurrent attacks of acute enlargement of the liver and spleen repeatedly coincided with a fall of lipæmia from 8% to 2%. Again, in Ziegler's case lipodystrophy was based on a subcutaneous inflammatory process, and there is no reason to think that the retroperitoneal fat depots would disappear and could probably still store excess of circulating fat. Further, although the diabetes seemed severe when the rapid swelling of the liver took place, it was easily controlled by diet, and a condition of carbohydrate metabolism (blood-sugar 130 mg. per 100 ml.) was quickly reached at which even the present case would have shown no lipæmia. For these reasons I think it fair to suggest that the two cases are fundamentally identical.‖

(To be concluded)

AMINOTHIAZOLE IN THE TREATMENT OF THYROTOXICOSIS

MARCEL PERRAULT DANIEL BOVET

EXPERIMENTAL and clinical results obtained when aminothiazole (2921 R.P., 'Abadol') was used to neutralise thyroid function and to remedy thyrotoxicosis have been described by Perrault, Bovet, and Droguet (1944a and b), Perrault, Bovet, and Jeantet (1944), Perrault and Bovet (1945), and Bovet et al. (1946).

From our clinical experience of this drug in 129 cases we conclude that it is highly efficacious and well tolerated. It seems to us, therefore, that aminothiazole is superior to other substances previously recommended, such as thiourea and thiouracil, which have an undoubted therapeutic value but are not well tolerated (Astwood 1943a, 1944, Rawson et al. 1944, McGavack et al. 1944).

We decided to study the active properties of aminothiazole (Astwood 1943b) in view of the observations made in human beings by Dr. Jeantet of Lyons. In the summer of 1943 ¶ his attention was drawn to unusual goitres in workmen employed in the extraction of aminothiazole, which is used in industry in large quantities for the preparation of sulphathiazole. Not one of the men so affected complained of functional or general disorders. They showed no signs of thyrotoxicosis, and their basal metabolism was reduced. One employee who previously had a mild thyrotoxicosis found that his symptoms disappeared and his general condition improved after he had worked for two months at this process. From this chance observation emerged several facts which seemed to indicate that aminothiazole could lead to the formation of a goitre while reducing thyroid activity, and that it was relatively harmless.

Control experiments in animals and clinical trials in patients with thyrotoxicosis were next instituted. Our work had made considerable progress, and we had already published the results of our first clinical observations, when Astwood's (1943b) report on 106 different chemical preparations became obtainable, in which he first made known the antithyroid action of aminothiazole in the rat. On the whole our experiments, which are described below, have confirmed and supplemented his findings.

‖ Dr. Posner, of Czechoslovakia, has just written to say he has an identical case in a boy of six.

¶ At that time we were unfortunately unable to peruse the Anglo-American writings in this field.

Up to January, 1946, the number of cases treated totalled 129, as follows**:

Thyrotoxicosis	71	Angina pectoris ..	8
Vagosympathetic imbalance	16	Pulmonary tuberculosis	9
Hypertension	10	Normal subjects ..	15

HISTOLOGICAL FINDINGS IN RATS

Effects of a Single Injection of Half the Lethal Dose.—After 48 hours the gland was congested and showed localised œdema and hæmorrhages. The colloid in the vesicles was either absent or scanty, vacuolated, and altered in its staining reactions. Much of the cubical epithelium had desquamated, and many nuclei showed pyknotic changes. Briefly, the lesions were those of congestion and inflammation, with diminution of the colloid. From the fifth to the fifteenth day very tall columnar epithelium took the place of the desquamated cubical epithelium, with the result that the picture resembled that of a salivary gland. The colloid was still scanty or absent. From the eighteenth day onwards the thyroid structure regained its normal appearance, but some areas continued to resemble salivary-gland tissue, and some were still necrotic. By the thirtieth day the thyroid was almost normal.

The weights of the glands examined tallied well with the histological changes. To begin with there was an increase of weight corresponding to the stage of œdema and congestion. From the fifth to the ninth day there was a reduction in weight indicating the stage of necrosis. From the ninth to the fifteenth day the weight slowly increased, this being in step with the renewal of the epithelium, and from the eighteenth to the thirtieth day there was a considerable rise in weight in accordance with the renewal of the epithelium and the reappearance of the colloid. The average weights of thyroid glands observed were as follows:

	Weight (mg.)		*Weight (mg.)*
Controls	11·0	After 15 days ..	18·5
After 2 days ..	18·0	„ 18 „ ..	24·5
„ 6 „ ..	14·5	„ 30 „ ..	31·0
„ 9 „ ..	10·0		

Effects of Repeated Injections.—Repeated subtoxic doses (0·25 g. per kg.) given for ten days produced a morphological effect identical with, but more pronounced than, that seen after a single injection. The continued administration of the drug did not hinder the renewal of the epithelium. After ten injections given on consecutive days the degenerative changes were confined to certain areas only, most of the gland acquiring a resemblance to salivary-gland tissue as already described.

Repeated doses smaller than the subtoxic dose produced various effects according to the size of the dose and the length of its administration. After 0·2 g. per kg. had been given for 5–8 days, a few vesicles with normal colloid could still be seen at the periphery of the gland; all the other vesicles had disappeared. After a dose of 0·1 or 0·05 g. per kg. given for the same period, the colloid, though still plentiful, had diminished in amount, and its staining properties had altered. Here and there, particularly in the middle of the gland, were limited areas of necrosis and patches of glandular disintegration.

If treatment is continued beyond eight days it does not appear to have much effect on the morphology of the gland. In animals treated for twenty-five days, and even for ninety days, the structure of the vesicles persists, colloid is absent, and the epithelium is columnar.

If the drug, instead of being given in a single daily dose, is given more or less continuously, dissolved in the drinking-water, the effective dose is much smaller. If the rat drinks a solution of 0·01%–0·02%, which corresponds to a daily absorption of 10–20 mg. per kg., one may note a great change in the colloid, and it may even disappear completely.

After thirty days' treatment the glands of two rats exhibited throughout a "salivary" appearance, with absence of the colloid. In 3 animals of the same group the structure of the thyroid had returned almost entirely to normal six days after treatment ceased.

Examination of the viscera of rats receiving protracted treatment did not show any appreciable changes, except a slight infiltration of the liver and a mild interstitial reaction in the kidneys. The testes, ovaries, pancreas, and suprarenals were normal. The parathyroid glands occasionally showed sclerosis, which did not seem to be related to changes in the thyroid. The pituitary gland was slightly congested.

It thus appears at first sight that aminothiazole is a toxic substance with a remarkably selective action on the thyroid gland. The lesions produced healed quickly under the experimental conditions.

PHARMACOLOGY AND MODE OF ACTION

In rats and mice injected with large doses the basal metabolism is gradually reduced, in most cases by about 20%.

Aminothiazole has little effect on the metamorphosis of batrachians.

The toxicity of aminothiazole is relatively low. Half the lethal dose in the mouse is 0·25 g. per kg., given subcutaneously for six days. Poisoning may be cumulative and cause late death after various periods. The animals show a characteristic œdema of the face, with swollen cheeks and the eyes barely visible.

Aminothiazole has no effect on the blood-pressure; nor does it exert any action on the tone of smooth muscle, on respiration, or on the excitability of the autonomic nervous system. It is mildly antiseptic, being bacteriostatic in a strength of 1 : 100 and bactericidal in a strength of 1 : 20 when tested with *Staph. aureus*. It is rapidly destroyed in the body. It can be estimated in the body fluids by a method of diazotisation and linkage similar to that used with the sulphonamides.

The action of aminothiazole is very similar to that of the other antithyroid substances. This is made clear by the investigations of Joliot-Curie et al. (1945), who, using radio-active iodine, have shown that aminothiazole hinders the synthesis of di-iodotyrosine and thyroxine. Their findings agreed with those of Kennedy (1942), Richter and Clisby (1941), Mackenzie et al. (1941), and Astwood et al. (1943) and the hypothesis suggested by Harington (1944). Twenty-four hours after the injection of ionised iodine the search for newly formed di-iodotyrosine and thyroxine showed that premedication with aminothiazole, though it had no effect on the penetration of iodine into the thyroid, did in fact prevent the normal synthesis of thyroid hormone.

The reactionary hyperplasia is almost certainly due, as Griesbach et al. (1941) and Mackenzie et al. (1941) suggested, to some result of pituitary reaction to the shortage of thyroxine. The analogy between the successive histological changes seen after poisoning with aminothiazole and those seen when thyroid activity is stimulated by the injection of a thyrotropic pituitary hormone is fairly evident when serial sections are examined.

CLINICAL RESULTS IN THYROTOXICOSIS

Dosage.—The drug was given exclusively by mouth in either cachets or tablets each containing 0·01 g. of aminothiazole. The effective dose seems to be about 0·4 g. When treatment is first started we often give 0·6 or even 0·8 g. When improvement has occurred we like to make quite sure of a satisfactory result and continue treatment with maintenance doses of 0·3 or 0·2 g., or even less. This dosage is divided into 3–6 portions. It is convenient to give three doses

** The total includes personal cases and those of our colleagues Drs. Boudreaux, Bourdin, de Brux, Célice, Droguet, Léger, Pellerat, and Sigwald.

during the day, one with each of the principal meals. It is best to give it in the middle or at the end of the meal.

At first we gave interrupted treatment at various intervals, but we now consider that it is better to give a longer uninterrupted course, which should last long enough to keep the patient for some weeks or months at a weight which is normal for height, age, sex, and build; to keep the pulse-rate somewhat below the average—i.e., 64–70—and to keep the metabolic rate normal or even a little below normal—i.e., between −1% and −5%. Experience has further shown that it is sufficient in practice to check the weight weekly and the pulse-rate daily. Thus the duration of treatment varies considerably according to the severity of the condition, the length of history of thyrotoxicosis, and the response to treatment.

The length of treatment varied from three weeks (which we now consider too little) to six months. One of our patients, who has been completely cured of his thyrotoxicosis, except for the slowly regressive exophthalmos and slight goitre, is now in the eighth month of treatment with aminothiazole, but is receiving the very small daily dose of 0·1 g., which is sufficient to keep him in balance.

Complications and Undesirable Effects.—On the whole the drug is well tolerated. In the whole series of 129 subjects, we encountered complications†† in 15 (11·6%); in 8 cases these were transitory and in the other 7 they were severe enough to necessitate the cessation of treatment. The details were as follows:

Drug fever	7	Digestive intolerance ..	2
Erythema	3	(1 with fever)	
(2 with fever)		Lumbar pain and oliguria ..	2
Urticaria	1		

In the cases of thyrotoxicosis we saw one case of erythema after nine days' treatment in a patient with a generally raised sensitivity; one case of general reaction with fever, vomiting, and a transient nodular eruption in a patient whom we were able to continue to treat by giving nicotinic acid at the same time in doses of 0·05 g. for each 0·1 g. of aminothiazole; one case of transient fever; and one slight case of gastric intolerance, which also yielded to nicotinic acid.

We have not observed any cyanosis, headache, jaundice, albuminuria, or blood changes—i.e., those signs of intolerance which may either be merely uncomfortable or may end dramatically, such as agranulocytosis, which, as noted by Himsworth (1944), and Berk and Sapeika (1944) for thiourea and by McGavack et al. (1944), Rawson et al. (1944), and Astwood (1944) for thiouracil, are a great hindrance to successful treatment with certain antithyroid drugs.

In France we have no opinion on the value of thiouracil other than that gained from a study of the literature in English. But, in contrast with this, considerable use has been made of thiourea by Albahary (1944), Laroche (1944), and ourselves (1945) among others. Our impressions are in line with those gained by Anglo-American clinicians: thiourea is certainly effective but not well tolerated.

Systematic studies of normal persons who have had lengthy courses of aminothiazole showed no evidence of any significant change in renal and hepatic function or in the body fluids, blood, or tissues.

Two properties of aminothiazole must be emphasised: (1) It is a reducing substance; hence its presence will falsify the tests for glucose by the usual methods. (2) It will impart a colour to the body fluids, serum, and urine; this may be anything from orange-yellow to bright red. The latter colour is often seen and has often been a nuisance, as it interferes with the Bengal-red test. Its presence has no real significance either for prognosis or for the continuation of treatment. It appears to be due to breakdown products of the drug.

As a measure of prudence we gave aminothiazole alone at the beginning of our clinical trials. Now we like to give it with nicotinic acid, which, as shown above, increases gastric tolerance to the drug and perhaps general tolerance also, as it does for the sulphonamides. If it proved necessary to give other drugs concurrently, we have done so without noting any disadvantages from this practice, and so far we have not found any incompatibility.

Activity.—This has always been satisfactory and often striking. Naturally, the rapidity of action and its efficacy have varied from case to case, but the action has always been produced and is far and away superior to that of other drugs. Moreover, most of the patients treated were persons who had not benefited from iodine therapy. Except a few very bad cases of heart-failure, all those treated were kept up and about; we did not give any of the usual adjuvant remedies.

Subjectively the effect is felt very quickly. Within a few days, usually between three and seven, the patient feels relieved of most of his functional disturbances. He feels more calm and less irritable, sleeps better, and is less or no longer affected by spasms of digestive and respiratory disturbance. He will of his own accord stop taking the adjuvant drugs which he had hitherto been taking, such as 'Gardenal,' eserine, and bromides.

Objectively the results are no less striking, but the various signs of disease are not equally affected. Tachycardia and cardiovascular abnormalities are the quickest to respond and exophthalmos the slowest.

At first the *goitre* did not seem to be altered. But, since we instituted longer treatment or adapted the treatment better to the particular needs of each case, we can reasonably hope for regression of the goitre. Among the first changes were the rapid disappearance of the vascular throbbing and humming so typical of the goitre in thyrotoxicosis. Then, after the gland had sometimes swollen for a little while, one noted a slow but sure shrinkage. The consistence of the swelling was peculiar and quite different from that noted in thyrotoxicosis or in simple goitres. The thyroid was firm but not hard, feeling somewhat like a tightly rolled ball of gauze. If the swelling, though diffuse, is greatest in one lobe, it is this lobe which shows the slowest diminution in size. The same applies to the nodules in a nodular goitre. The length of history of the goitre seems to be the most important factor affecting the rate of shrinkage. If it has been present only for a short time, one may expect a rapid and complete disappearance. But an old chronic goitre shrinks much more slowly, and the residual swelling may be somewhat disappointing æsthetically. Fortunately, however, most goitres in thyrotoxicosis are not very large. We see then that the goitre is one of the most persistent features of the disease. Nevertheless, one can and should improve it if treatment is carried out with sufficient perseverance.

Exophthalmos must, on the contrary, be regarded as almost entirely resistant to treatment. It is true that in mild cases, in which it has amounted to a mere brightness of the eye or a slight protrusion, it may disappear almost completely. But in the more advanced cases such improvement as takes place is far from adequate. This is always the most persistent sign, whatever form of treatment is used.

Tremors disappear entirely or are sufficiently reduced in 7–10 days to permit the patient to write again without difficulty or work at a trade which requires manual dexterity.

Tachycardia has always cleared in 5–15 days, with a return of the pulse-rate to about 72. The pulse also

†† We have not included in this group the common finding of a red coloration of the urine, which does not seem to be of any significance. We have heard of one case of toxic jaundice, and of one death from hyperthermia on the tenth day, in which the responsibility of the drug was not clearly established.

becomes steady, and the patient is freed from the sensation of throbbing which many find so unpleasant. If the heart has shown signs of weakness, these soon disappear. If heart tonics have been given, their effects are at first augmented and made more certain; later they can either be stopped altogether or used in much reduced doses. Of all signs tachycardia was the one which responded most rapidly and most satisfactorily to treatment.

The *body-weight* increases, if sufficient nourishment is taken, by several kilogrammes. This increase in weight is not always immediate but may be delayed until treatment has continued for a month, even if there has been an obvious objective improvement and the basal metabolism has also improved considerably. It is better to try to get the weight up to the upper limit of normal for a given age, height, sex, and build.

The *basal metabolic rate* returns to normal within a few weeks. We think it better not to leave it at a figure of about +10%, usually considered to be sufficient, but to aim at a lower figure, from −1% to −5%, and to keep the patient at about that mark. It has been shown in practice that observation of the weight and of the pulse-rate is sufficient to regulate treatment.

The *blood cholesterol* rises to normal if it has been low at the start of treatment, but the figure and its variations with treatment have no absolute value in hyperthyroidism.

CONCLUSIONS

It is impossible today to think about thyrotoxicosis without considering the antithyroid drugs. Among the preparations found in this group aminothiazole has been found very effective, reliable, and easy to handle.

Without dispensing entirely with surgery, one may use antithyroidic products in preoperative treatment, even in very grave cases. It is largely equivalent to iodotherapy.

In most cases, however, the indications for the use of the drug do not stop here. It may be used alone to provide complete cure in recent or mild cases. In other patients it will bring about a balance equivalent to functional cure, treatment then being with smaller doses.

Aminothiazole is harmless enough to be given in cases in which, though thyrotoxicosis is not definitely diagnosed, it is possibly present.

REFERENCES

Albahary, C. (1944) *Paris méd.* **34**, 202.
Astwood, E. B. (1943a) *J. Amer. med. Ass.* **122**, 78.
— (1943b) *J. Pharmacol.* **78**, 79.
— (1944) *J. clin. Endocrinol.* **4**, 229.
— Sullivan, J., Bissell, A., Tyslowitz, R. (1943) *Endocrinology*, **32**, 210.
Berk, L., Sapeika, N. (1944) *Clin. Proc.* **3**, 95.
Bovet, D., Bablet, J., Fournel, J. (1946) *Ann. Inst. Pasteur*, **72**, 105.
Griesbach, W. E. (1941) *Brit. J. exp. Path.* **22**, 245.
— Kennedy, T. H., Purves, H. D. (1941) *Ibid*, **22**, 249.
Harington, C. R. (1944) *Proc. roy. Soc.* B, **132**, 223.
Himsworth, H. P. (1944) *Proc. R. Soc. Med.* **37**, 693.
Joliot-Curie, F., Bovet, D., Courrier, R., Horeau, A., Poumeau-Delille, G., Sue, P. (1945) Société médicale des hôpitaux de Paris, meeting of May 18.
Kennedy, T. H. (1942) *Nature, Lond.* **150**, 223.
Laroche, G. (1944) Société d'endocrinologie, meeting of Nov. 23.
McGavack, T. H., Gerl, A. J., Vogel, M., Schwimmer, D. (1944) *J. clin. Endocrinol.* **4**, 249.
Mackenzie, J. B., Mackenzie, C. G., McCollum, E. V. (1941) *Science*, **94**, 518.
Perrault, M., Bovet, D. (1945) *Ann. Endocrinol.* **6**, 86.
— — Droguet, P. (1944a) Société médicale des hôpitaux de Paris, meeting of Oct. 27.
— — — (1944b) *Paris méd.* **34**, 213.
— — Jeantet (1944) *Bull. Soc. méd. Hyg. Travail*, Nov. 20.
Rawson, R. W., Evans, R. D., Means, J. H., Peacock, W. C., Lermen, J., Cortell, R. E. (1944) *J. clin. Endocrinol.* **4**, 1.
Richter, C. P., Clisby, K. H. (1941) *Proc. Soc. exp. Biol., N.Y.* **48**, 684.

Dr. Ernest W. Goodpasture, professor of pathology at Vanderbilt University, Nashville, Tennessee, is to receive the annual award of $5000 from the Passano Foundation for his achievements in developing the method of propagating viruses by inoculation of chick embryos, and for contributions to knowledge of the cell-parasite relationship in bacterial and virus infection.

NUTRITIONAL NEUROPATHY
IN PRISONERS-OF-WAR AND INTERNEES FROM HONG-KONG

C. ASTLEY CLARKE, M.D. Camb., M.R.C.P.
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SURGEON LIEUT.-COMMANDERS R.N.V.R.

THIS is a study of neurological symptoms in a group of about 200 sick internees and prisoners-of-war released from Hong-Kong in September, 1945, who were transferred to the Royal Naval Hospital, Sydney, Australia, for further treatment. They comprised officers and men from the three Services and Merchant Navy, and civilians of both sexes. They had all been taken prisoner at the fall of Hong-Kong in December, 1941, and, although kept in three main camps under varying conditions of discipline, had had basically the same diet. Some of them, however, had occasionally augmented their rations in various ways, such as smuggling through friendly Chinese, or the rare Red Cross parcel.

The accompanying table gives the weight and calorie value of the daily rations in one of the camps; the figures represent a maximum, the stated amounts often not being available.

WEIGHT AND CALORIE VALUE OF DAILY RATIONS AT ONE CAMP

—	Minimum required by League of Nations standard	1942	1943	1944	1945
Protein (g.) ..	75	52·0	45·1	37·5	33·2
Fat (g.)	50	31·3	20·2	22·7	24·8
Carbohydrate (g.)	400	337·5	298·4	300·6	343·0
Calories	2400	1753	1596	1566	1732
Vitamin A (I.U.)	5000	10,135	10,347	6910	4978
Vitamin B (I.U.)	250–500	163	132	100	90
Vitamin B (S.B.U.)	400–800	216	161	58	75
Vitamin C (mg.)	50–75	67	73	64	73
Calcium (g.) ..	0·800	0·265	0·250	0·317	0·264
Phosphorus (g.)	1·200	0·537	0·512	0·576	0·548
Iron (g.).. ..	0·012	0·015	0·003	0·012	0·009

The mainstay of the diet was ½–¾ lb. of rice a day, usually polished and often deteriorating from storage. After the first year meat and eggs became unobtainable, but small amounts of dried fish were available, the maximum being 2 oz. a day. Other inconstant additions were beans, peanut-oil, and green vegetables (often only chrysanthemum leaves). As far as can be ascertained, at no time did maize form a constituent part of their diet. On such rations ratings were expected to do hard manual labour, and officers and internees could volunteer for duties round the camp; internees who worked were given additional food.

NEUROLOGICAL SYNDROME

Under these conditions symptoms developed with remarkable constancy and in a similar chronological order. Thus within three months of imprisonment the presenting symptom of swelling of the ankles arose; this was followed by weakness and paræsthesia of the limbs, difficulty in walking, and failure of vision and hearing. Towards the end of 1942 and early in 1943 skin lesions suggesting pellagra were noted—stomatitis and dermatitis of the scrotum, the latter being extremely common. At this stage also a distressing symptom described as "electric" or "jumping" feet made its appearance; this was characterised by a burning sensation and extreme hyperæsthesia of the soles, which caused

loss of sleep and made the sufferers immerse their feet in cold water for relief. The skin symptoms and to some extent the "electric" feet responded well to nicotinic acid, which became available in 1943; but the neuritic symptoms remained essentially stationary despite thiamine and nicotinic acid, and the end-result on release in the worst cases was defective vision, nerve deafness, gross ataxia, anæsthesia, and wasting of the limbs.

Most patients had diarrhœa at some time during their imprisonment, but chronic diarrhœa was not a constant feature in the history. On admission to R.N. Hospital, Sydney, there were no definite signs of frank vitamin-deficiency, such as the skin lesions of pellagra or ariboflavinosis, but all the patients had lost a considerable amount of weight.

Of the 200 mixed medical and surgical cases under review, 74 showed grossly abnormal neurological signs, which may be classified briefly as follows:

	Cases
Optic atrophy and ataxic paraplegia	31
Ataxic paraplegia only	21
Optic atrophy only	13
Optic atrophy, nerve deafness, and ataxic paraplegia	6
Optic atrophy and nerve deafness	3

ILLUSTRATIVE CASE-RECORDS

The following cases are selected as illustrating gradations and varieties of the severe syndrome.

CASE 1.—A man, aged 46, was taken prisoner on Christmas Day, 1941. In April, 1942, he noted œdema of the ankles, and in October, 1942, he had general weakness of the legs and vision started to fail, everything becoming hazy until January, 1943, when he could hardly see at all.

Early in 1943 he started to have "electric shocks" in the legs. Beginning in October, 1942, and continuing almost for three years he had nicotinic acid 20 mg. and thiamine 3 mg. nearly every day by injection, without any improvement in his symptoms. He lost about 90 lb. in weight in all.

On admission to R.N.H. he complained mainly of difficulty in vision and weakness of the legs. Examination of his eyes showed vision R and L 6/60; peripheral fields full; absolute central scotoma in both eyes; very slight bilateral temporal pallor. Both maculæ showed a few pin-point spots of exudate and very fine hazy-looking granules.

Examination of his central nervous system showed loss of sensation to light touch and pinprick, and of joint sensation over feet, legs, and thighs, extending to the level of the umbilicus; weakness of dorsiflexion of feet; ataxia of legs and rombergism; ankle-reflexes absent but other reflexes normal.

There had been no improvement in this case with parenteral vitamin therapy over three years.

CASE 2.—A man, aged 25, taken prisoner on Christmas Day, 1941, noted in June, 1942, that his vision was starting to fail; the failure became gradually worse and reached its maximum in December, 1943. In September, 1942, weakness of the legs and pain in the muscles developed. In December, 1943, deafness was noted, which has persisted.

At the end of 1943 he had six injections of thiamine and a few of nicotinic acid. In 1944 he was given nicotinic acid 2·36 g. in four months, and in 1945 thiamine and nicotinic acid daily for some weeks. During the whole time he was a prisoner-of-war he was liable to attacks of diarrhœa. He did not have malaria.

On admission to R.N.H. he complained mainly of difficulty in reading and walking. He thought his eyesight had improved a little since December, 1943, but he still had the greatest difficulty in reading. If he looked at a page, there were blank spaces in it, and he could not judge distances. Vision: R 6/36, L 6/60. There was only a trivial error of refraction; glasses were of no practical value. Fields showed a definite central relative scotoma in each eye. Fundi showed temporal pallor of both disks, vessels normal. Both maculæ were studded with dots of yellow exudate.

Examination of his central nervous system showed slight weakness of extension of wrists; ataxia, with high stepping gait due to bilateral foot-drop; hypersensitivity of soles, but, in general, anæsthesia of glove-and-stocking type; much wasting of legs, and paralysis of dorsiflexors of feet; knee-jerks present, but ankle-jerks absent.

A fractional test-meal showed low free acid. The Wassermann reaction was negative. Cerebrospinal fluid showed no abnormality.

This case shows the complete syndrome with gross defect in vision, deafness, and signs of peripheral neuritis.

CASE 3.—A man, aged 27, was taken prisoner on Christmas Day, 1941. In April, 1943, he noted failure of vision and deafness, and "electric feet" and foot-drop developed. Temporal pallor of the optic disks was observed. In September, 1943, tinnitus came on.

On admission to R.N.H. he complained mainly of total deafness, tinnitus, defective vision, and difficulty in walking. Vision: R 6/60, L 3/60; central scotomata present; slight temporal pallor of disks.

He could just hear a shout in either ear; both tympanic membranes were intact. He had bilateral foot-drop, with high stepping gait, ataxia, and rombergism. There was no vibration sense in the ankles. Knee- and ankle-reflexes were absent, and there was stocking anæsthesia to pinprick. A fractional test-meal showed much diminution of free acid.

This case showed involvement of 2nd and 8th cranial nerves in addition to peripheral neuritis.

CASE 4.—A man, aged 60, taken prisoner on Christmas Day, 1941, noted in April, 1942, that his legs were swollen. He received no treatment and continued to work. In September, 1942, when working long hours in the sun, he noted pins-and-needles all over his eyes. His vision failed rapidly, and he went almost blind in both eyes within two days. There has been no change since that time, and for three years he has not been able to read. In December, 1942, pellagra-like symptoms started: sore tongue, dermatitis of the scrotum, and "electric feet." This phase of his illness lasted about four months. Irregularly during 1943 he had thiamine and nicotinic acid by injection. In September, 1943, he had malaria.

On admission to R.N.H. he complained mainly of poor vision and of numbness in his legs. Examination of his eyes showed cornea, media, pupils, and ocular movements normal. Vision eccentrically was 6/6, 6/6, but the letters were partially obscured by "white patches." He could not see to read ordinary print, but the provision of a 2·5 D lens in each eye helped him to do so. Peripheral fields full. Small paracentral relative scotoma present in right eye close to the fixation point, and a much larger one in the left eye. Fundi showed vessels normal but both disks greyish and atrophic. Both maculæ showed numerous white patches of exudate. Examination of central nervous system showed reflexes, sensation, power, and gait normal.

Note the sudden onset of failure of vision.

CASE 5.—A man, aged 44, was taken prisoner on Christmas Day, 1941. In January, 1942, he developed dysentery, and he had chronic diarrhœa for the next seven months. In December, 1942, numbness of hands and feet and a prickling sensation in the soles developed. At the same time he had septic blisters on his body and a sore tongue. He was in the camp hospital from December, 1942, almost all the time until his release. During this period he received thiamine and nicotinic acid. In December, 1943, his sight began to fail gradually.

On admission to R.N.H. he complained that his hands and feet were numb, and that his legs jumped at night. He said that his vision was very bad, but thought it had improved slightly in the previous six months. Vision: R 3/60, L 3/60, not improved by correction of refraction error; absolute central scotoma of both eyes; bilateral temporal pallor and yellow dot-like exudate all over both maculæ.

Examination of his central nervous system showed Romberg's sign positive; incoördination of both lower limbs; absent reflexes in both upper and lower limbs; no foot-drop; sense of position normal; glove-and-stocking anæsthesia.

A histamine test-meal showed hyperchlorhydria. Wassermann reaction was negative. Cerebrospinal fluid was normal.

Note the onset of eye symptoms while he was on a steady intake of thiamine and nicotinic acid.

CASE 6.—A man, aged 24, who had been taken prisoner in the autumn of 1941 and had had no previous diseases, noted in April, 1942, failing vision, haze in front of eyes, photophobia, and headaches. In August, 1942, he had

bacillary dysentery lasting five weeks. In December, 1943, he became deaf; legs were numb, and he had difficulty in walking; numbness extended to umbilicus; he lost his sense of balance; and knuckles of both hands became sore. He started to have thiamine and 'Apellagrin' by mouth and continued with this until release. In January, 1944, he had dysphonia, but no pain; some difficulty in swallowing; effort dyspnœa; hesitancy and frequency of micturition; sore mouth and tongue.

Examination in prison-camp hospital in February, 1944, showed: vision, R 6/60, L 4/60, and slight corneal dystrophy. Fundi showed slight temporal pallor. Pigmentation with stippling at the maculæ. Pupils normal. Corneal reflexes absent. Right facial weakness. Nerve deafness. Loss of sensation to pinprick up to nipple line. Sense of vibration and position lost in both legs. Hyperæsthesia of soles. Pronounced ataxia; unable to stand. Deep reflexes exaggerated in both upper and lower extremities. No clonus. Plantar response flexor.

In March, 1944, interosseous muscles of hands were noted to be wasted, and he had bilateral foot-drop. In July, 1944, he had incontinence of urine. In August, 1944, he had a sharp sensation of burning in his feet. In April, 1945, there was little change generally; aphonia still noted.

On admission to R.N.H. he complained of great difficulty in walking, numbness and burning of the feet, foot-drop, deafness, poor vision, urgency of micturition, and nocturnal enuresis.

Examination showed pallor of optic disks; central scotoma in both eyes; anæsthesia of right side of the face, and right facial paresis; bilateral nerve deafness; voice hoarse. There was much wasting of the intrinsic muscles of the hands, with weakness of the interossei, but no anæsthesia. In the legs there was loss of sense of vibration and position. Bilateral foot-drop, with spastic scissor gait and knee- and ankle-clonus. Generalised muscular wasting. Deep reflexes increased. Plantar responses flexor. Abdominal reflexes present. Rombergism ++. No fibrillary tremors.

A fractional test-meal gave a very low acid curve. Cerebrospinal fluid and blood-count normal. Wassermann reaction negative.

Bulbar symptoms were present, and there was a general similarity to amyotrophic lateral sclerosis with sensory changes.

CLINICAL FEATURES

The most constant finding was impairment of visual acuity due to central and paracentral scotomata, the peripheral fields remaining full. The fundi showed partial optic atrophy and in many cases macular degeneration was present. On account of this finding we have not ascribed the optic atrophy to retrobulbar neuritis as other authors have done, since the pathology appears doubtful. Deafness was usually bilateral and of the nerve type. The paræsthesiæ, sensory loss of stocking type, ataxia, foot-drop, and loss of deep reflexes were characteristic of polyneuritis, but tenderness of the calves was not seen. The patients' description of the "electric feet" strongly resembled the pain of "immersion foot." Some cases showed increased deep reflexes, spasticity, and ataxia out of proportion to the degree of anæsthesia, and in these it was thought that the cord must have been damaged. Some of these cases showed a striking similarity to subacute combined degeneration, although an extensor plantar response was never seen. Case 6 began with the typical story of failing vision, numbness of the legs, and ataxia; but the signs at the present time closely resemble amyotrophic lateral sclerosis with bulbar palsy and additional sensory signs. Several similar cases were seen by Australian doctors in prisoners-of-war, and it is thought that the condition is but a variant of the more usual form of the neuropathy.

Blood changes were not significant, and no definite relationship between the severity of symptoms and achlorhydria was noted. No abnormality was ever noted in the cerebrospinal fluid. An earlier investigation in H.M.H.S. *Oxfordshire* shortly after the prisoners' release showed no general lowering of the level of plasma proteins, and œdema was never a very prominent symptom.

One interesting feature was that in 1943 diphtheria raged through the camps, and owing to lack of antitoxin treatment was inadequate; despite this there was no recrudescence of polyneuritis.

TREATMENT

Since their release the patients have been under observation for two months, during which time they have been on a high-calorie diet and massive-vitamin therapy. Liver extract was also given in many cases. Patients with ataxia and muscle weakness were instructed in re-educational exercises, and every effort was made to rehabilitate them generally. The results on the whole have been disappointing; subjective improvement has taken place in some cases, but the neurological signs have remained unchanged, vision in particular not showing any response.

DISCUSSION

The syndrome seen in these patients is identical with that described by Spillane and Scott (1945) in German and Italian prisoners-of-war in Allied hands in the Middle East. There can be little doubt that, when a group of previously healthy men, living on a monotonous and inadequate diet, develop similar symptoms, a dietary deficiency or intoxication is the likely cause.

In Hong-Kong the diet was grossly deficient in protein, fats, and all parts of the vitamin-B complex; in Spillane and Scott's cases, though the food on paper was excellent, supplies were not available, and the amount actually received by the men was inadequate.

Although it would be easy to ascribe the syndrome to a pure vitamin deficiency, in our opinion there are serious objections to this hypothesis. Thus, several of our patients developed fresh neurological symptoms and signs while on an adequate intake of synthetic vitamins in the camp hospital. Again, vitamin therapy given to established cases in the camp cured the tongue and scrotal lesions but caused little improvement in the neurological signs. Further, the neurological symptoms developed in almost epidemic proportions within a few months of captivity, reached a maximum, and then tended to remain stationary or improve slightly despite steadily decreasing diet. All this suggests the presence of a toxic agent which was operative more in the earlier months of captivity.

The literature on beriberi and allied disorders provides further evidence in this direction.

(1) Taguchi and his colleagues (1922) produced neuritic symptoms within 4–5 days in volunteers fed on overmilled rice. This seems too short a time for a deficiency disease to develop.

(2) Beriberi broke out in a community in Sierra Leone in 1931 where the diet had been expressly designed to ensure an adequate intake of vitamin-B complex. The disease in some was controlled by removing the pericarp of the rice and discarding the water in which the grain was cooked. This extract was toxic to animals.

(3) Beriberi does not develop in simple starvation; shipwrecked sailors who have lived for incredible periods on rafts on a starvation diet do not develop beriberi. Fraser and Stanton in 1911 showed that fowls fed on water lived longer than those fed on polished rice.

(4) Walshe (1941) points out the likelihood of a toxic factor being present in all forms of polyneuritis. The mode of onset, physical signs, and progress in our cases strongly suggest a toxin, and there is considerable resemblance to similar diseases caused by known toxins. Among these are (*a*) lathyrism, a paraplegia associated with dimness of vision due to the consumption of a vetch or some varieties of pea (pulses formed a proportion of the diet in the Far East, and lathyrism has been described in Italy, Persia, and India when wheat flour has been adulterated with pea flour); and (*b*) Scott's palsy, a neuritic condition described by Moore (1937) as developing in Nigeria in those living on the tubers of the cassava plant. Clark (1941) found that cassava inhibited the action of nicotinic acid, and therefore more nicotinic acid was required to prevent deficiency symptoms in animals fed on cassava.

(5) There is a conspicuous relationship between a high carbohydrate diet and the onset of beriberi, which develops

but rarely in those on a deficient diet with low carbohydrate intake.

In view of this evidence we believe that in the neuropathy under discussion there is a toxic or antivitamin principle in the diet—in our cases the rice—comparable to that described by Clark in cassava, which inactivates what little vitamin-B complex is present. Further, the low protein intake probably denudes the alimentary tract of its usual proportion of *Bact. coli*, and synthesis of thiamine in the gut is therefore diminished. The lack of thiamine leads to inadequate carbohydrate metabolism, with the resultant formation of pyruvic acid (Peters 1936, 1939). This interferes with the life of the nerve-cells and is probably the final common factor in all cases of polyneuritis.

If the toxic agent or antivitamin factor postulated in these cases could be discovered, it might shed light on the ætiology of other conditions, such as subacute combined degeneration of the cord, amyotrophic lateral sclerosis, and disseminated sclerosis, which some of our cases clinically resembled so closely. It seems possible that in these better recognised illnesses we may be dealing with metabolic upsets, of which only the end-results are at present apparent. Further work into their earlier manifestations might therefore be profitable.

SUMMARY

A nutritional neuropathy in a group of repatriated prisoners-of-war from Hong-Kong is described.

The response to dietetic and vitamin therapy was poor.

The similarity between these cases and other known neurological disorders is discussed.

The condition is considered to be due to a deficient diet containing a toxic or antivitamin principle, together with lack of vitamin-B complex.

We are indebted to Surgeon Commander L. P. Spero, R.N., for the ophthalmological reports; Captain G. T. Balean, H.K.V.D.C., for first-hand information about conditions in Hong-Kong; the medical officers of the camp hospitals and Surgeon Lieut.-Commander P. Jones, R.N., of H.M.H.S. *Oxfordshire*, for their excellent case-notes; and Surgeon Rear-Admiral J. A. Maxwell and the Medical Director-General of the Navy for permission to publish the cases.

REFERENCES

Clark, A. (1941) *J. trop. Med.* **44**, 126.
Fraser, H., Stanton, A. T. (1911) *Stud. Inst. med. Res. Fed. Malay St.* no. 12.
Moore, D. G. F. (1937) *Lancet*, i, 1225.
Peters, R. A. (1936) *Biochem. J.* **30**, 2206.
—— (1939) *Proc. R. Soc. Med.* **32**, 807.
Spillane, J. D., Scott, G. I. (1945) *Lancet*, ii, 261.
Taguchi, K., Hiraishi, S., Kwa, F. (1922) *Jap. med. World*, **2**, 133.
Walshe, F. M. R. (1941) *Lancet*, i, 33.

TOLERANCE TO OCTYL NITRITE IN ACHALASIA OF THE CARDIA

REPORT OF A CASE

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FOUR cases of achalasia of the cardia treated with inhalations of octyl nitrite have been reported by Field.[1] In all of them the relief of spasm was confirmed by radiography. In Field's cases no tolerance to octyl nitrite was observed, and the side-actions were negligible, except that in all cases a cold or a sore throat developed within 1–2 weeks of the start of treatment.

In June, 1945, an opportunity was provided for a careful observation of the action of octyl nitrite in a case of achalasia of the cardia. The diagnosis was proved at necropsy. In this case definite tolerance was produced quickly, and inhalation of octyl nitrite, pushed to the limit of the not inconsiderable side-actions, in less than three weeks had no effect on the patient's condition. The initial success and the ultimate complete failure of the drug were striking.

Method of Administration.—Ampoules of octyl nitrite (the nitroso-ester of 2-ethyl-n-hexylnitrite) were broken in a handkerchief and the contents inhaled. Each ampoule contained 3 minims. Field's cases used an inhaler, in which the concentration varies after use, but we were able to observe the effects of known quantities of the drug.

CASE-RECORD

A girl, aged 13, was admitted to the Royal Victoria and West Hants Hospital with six years' history of difficulty in swallowing, associated with pain between the shoulder-blades. She also had a history of petit mal and for some months had had chronic constipation and a troublesome cough. Weight 5 st. 13 lb. The girl was thin, of poor general development, and retarded intelligence, and approached every meal with trepidation.

On examination the percussion note was impaired over the right middle lobe, with crepitations attributed to œsophageal pressure. Her abdomen was slightly distended, and a mass of fæces was easily palpable in the right iliac fossa. Temperature 100° F.

Radiography of her chest showed chronic congestion of her right middle lobe and thickening of the upper part of the mediastinum. Sputum was repeatedly negative for tubercle bacilli. Wassermann reaction negative. Erythrocyte-sedimentation rate (Westergren) 3 mm. in 1 hour and 12 mm. in 2 hours.

Barium Swallow.—The œsophagus was much dilated throughout its length and contained residual fluid. There was well-marked obstruction at the cardiac orifice, the lower end of the œsophagus being smooth and tapering. No evidence of tracheal displacement or narrowing. Upper part of mediastinum widened owing to outline of œsophagus. Œsophagoscopy and bronchoscopy confirmed the diagnosis of achalasia.

Treatment.—Patient was treated with a belladonna mixture which gave very slight relief. Her chest condition cleared with a course of sulphathiazole, and she was transferred to Brompton Chest Hospital for further investigation and treatment. Barium swallow confirmed the findings already observed, and œsophagoscopy by Mr. Tudor Edwards showed the œsophagus to be grossly dilated and to contain masses of inspissated food. The œsophagus could be seen moving where it passed through the diaphragm, and a large bougie was passed without difficulty. Within a fortnight the child was very good at swallowing the bougie and had not vomited since starting to use it.

After she had used the bougie for a month her general condition had greatly improved. Weight 6 st. 4½ lb. Radiogram of chest was clear, and she was discharged with instructions to use the bougie and to continue with the belladonna mixture. Her cough, however, returned, and her weight dropped again to 5 st. 12 lb. Barium swallow showed no change in the appearances of the œsophagus, and she was readmitted to this hospital six months later. She was unwilling to persevere further with the bougie.

By this time some octyl nitrite had been obtained, and a trial was made.

Radiography.—The patient was screened in the upright position, right anterior oblique. An ampoule of octyl nitrite was inhaled, and exposures were taken immediately and at ½-min. intervals. The cardia began to open after 1½ min. The patient had pain after swallowing, but the opening of the cardia coincided with the relief of pain, and all the barium entered the stomach in 4 min. No unpleasant sensations were described, blood-pressure did not fall, and pulse-rate remained steady.

The swallow was then repeated, this time two ampoules being inhaled in quick succession; 4 sec. after inhalation of the second ampoule the cardia had opened fully, and ½ min. later all the barium was in the stomach. A second swallow 1 min. later showed that the cardia was still dilated and barium flowing freely into the stomach. After two ampoules the patient complained of fullness in the head and a "sinking feeling." There was a slight fall in blood-pressure, and the pulse-rate rose. There was no pain on swallowing.

Treatment with Octyl Nitrite.—Regular treatment was started with octyl nitrite. One ampoule was inhaled 5 min. before each meal. Complete relief was obtained. A mixed

1. Field, C. E. *Lancet*, 1944, ii, 848.

meal of meat, vegetables, and bread and butter was eaten without discomfort. No unpleasant sensation was felt, and the child was so pleased with life that for the first time in our experience she smiled. The bougie was discarded.

For two days all meals were taken easily, but on the third day the patient was unable to finish the meal and began to complain of pain towards the end. On the fourth day two ampoules were inhaled 5 min. before each meal. There was complete relief of all symptoms, but the girl complained of fullness in the head and flushing. For ten days she ate all meals with pleasure and became happy, responsive, and talkative.

At the beginning of the third week of treatment she complained of being unable to finish the meal. Pain had returned. After twenty-one days' treatment inhalation of two ampoules of octyl nitrite produced no relief, and a meal could not be eaten without swallowing the bougie; in fact she was in exactly the same condition as at the beginning of treatment. A further barium swallow could not be given, because the girl had reached the tolerance for X rays, above which it was considered inadvisable to go. She became unhappy and morose and sulked and cried for most of the day. Her cough returned and became greatly exacerbated. Three days later she began to have continuous abdominal pain and to vomit after all meals.

Heller's operation was performed by Mr. N. F. Adeney. The lower end of the œsophagus was exposed through a left paramedian incision. Slight muscular hypertrophy of the lower end was found, and the highest part of the œsophagus seen (about 1½ in. above the cardia) showed no dilatation. The muscle-fibres over the last 1½ in. of the œsophagus and the first inch of the stomach were divided. The width of the mucosa exposed varied from ½ in. above to 1 in. at the lower end, and the mucosa bulged as in a Ramstedt's operation. Convalescence was uneventful, and a month later she was discharged from hospital able to take meals with comfort.

Ten days after discharge she was readmitted with epigastric pain. Her abdomen was greatly distended, and fæces were easily palpable through the abdominal wall. Repeated enemata produced good results, but her distension was only slightly reduced. A week after admission her pain increased, and she developed signs of free fluid in the peritoneal cavity, but she was eating and feeling well. Four days later she became distressed, and paracentesis abdominis produced thin serous fluid which contained pus-cells but no organisms and was sterile on culture.

Laparotomy was performed by Mr. Adeney, and thin sanious pus with fibrinous deposits was found in the peritoneal cavity. The small intestine was distended. The cæcum was impacted with hard fæces, and the whole of the large bowel except the cæcum was distended with fæces. An ileostomy was performed and a drain inserted in the mid-line through a stab wound.

Next day her condition was poor and her distension not in any way relieved. Her distension continued to increase, her condition deteriorated, and six days later she died.

Necropsy.—Free fluid was found in the peritoneum, with fibrin flakes. There were recent massive adhesions in the region of the stomach; liver, gall-bladder, stomach, spleen, omentum, and transverse colon were matted together. The small bowel was grossly distended, and the large bowel distended, hypertrophied, and filled with putty-coloured fæces.

On separation of the adhesions under the diaphragm foul fluid escaped, and the whole of the lining of the lesser sac was stained and necrosed; stomach contents were escaping from a perforation just behind the lesser curvature, in the mid-zone, 3 in. from the site of the Heller's operation. There was no fibrosis round the perforation, but a few petechiæ were seen.

The muscular coats of the stomach and œsophagus divided at the Heller's operation had rejoined and showed a fibrous scar, the cardia barely admitting a finger. The œsophagus was not greatly dilated, but was hypertrophied. There was no evidence of stricture.

There was a small pleural effusion on either side of the chest, and all lobes of the lungs, more particularly the right upper and middle lobes, showed nodular induration, and on section the tissue was hard and crisp, suggesting interstitial fibrosis. There was early bronchopneumonia of the left base.

COMMENT

The patient had had, from time to time during her long history of achalasia, chronic constipation with distension and palpable masses of fæces in the abdomen. The large gut presented the appearance of Hirschsprung's disease. The association in this case of achalasia of the cardia and megacolon suggests that there was a general neuromuscular imbalance throughout the intestinal tract responsible for the two separate clinical conditions, an association pointed out by Rake,[2] who considers the two conditions analogous.

CONCLUSIONS AND SUMMARY

Octyl nitrite, previously reported in the successful treatment of achalasia of the cardia, was given a clinical trial on a case in which the diagnosis was subsequently proved at necropsy.

Known amounts of octyl nitrite were inhaled, and opening of the cardia was observed by radiography. Complete relief was given at first, but tolerance was rapidly produced, first to a minimal effective dose, and then to twice that dose. Finally the drug ceased to be effective.

Owing to shortness of supplies and the comparative rarity of the condition, a series of cases could not be tested; but it will be interesting to see whether octyl nitrite produces rapid tolerance in a proportion of cases of this condition and will therefore only be a practicable form of treatment in a proportion.[3]

We wish to thank Dr. Joan Lassetter for the radiography; Mr. N. F. Adeney for permission to publish the report of the operation; and Dr. E. Minchin for performing the necropsy. Ampoules of octyl nitrite were kindly supplied by British Drug Houses Ltd.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of medicine on April 30, a paper on

Ulcerative Colitis Treated with Intestinal Mucosa

was read by Dr. A. MORTON GILL. He said that consideration of the natural course of ulcerative colitis, with its spontaneous remissions and relapses, suggested that, at least in some cases, it might be the result of deficiency. Nine years ago he had seen a patient who had had the condition for three years, without responding to treatment, which had included a year in hospital. This patient was given raw pig's small intestine by mouth. The condition remitted as long as he continued the treatment, but relapsed when supplies failed; relapse and remission were repeated when treatment was voluntarily discontinued and then reinstituted. At that time dried preparations of pig's intestinal mucosa became available. Of two preparations (A and B),[4] enzymal activity was retained in one (A). With "A" there was little or no improvement, but with "B" there was complete remission within one month.

Of 5 further cases treated with raw pig's small intestine, 3 responded and 2 were not improved. Of 3 further cases treated with preparation "A," none showed material improvement. Of 12 cases given preparation "B," 8 recovered, and remain well as long as they continue the treatment.

Dr. Morton Gill concluded that the term "ulcerative colitis" includes more than one disease, or alternatively that the ætiology of the condition varies; in one group the cause may be an unspecified deficiency. No advantage is to be gained from increasing the daily dose of desiccated mucosa beyond 1 oz. (equivalent to ½ lb. raw material); on the other hand, a small daily dose, such as 1 drachm, is useless. There is always a latent interval of about three weeks between the commencement of treatment and appreciable improvement. Mucosa from all anatomical segments of the small intestine is effective, but possibly jejunal mucosa produces the most lasting effect.

2. Rake, G. W. *Guy's Hosp. Rep.* 1927, **77**, 141.
3. Since this paper was written a further case of achalasia, in a woman aged 32, has been tested with an octyl nitrite inhaler, and so far (six weeks) no tolerance has been noted (Dr. B. E. Tompson's case).
4. Gill, A. M. *Lancet*, 1945, **ii**, 202.

A new highly concentrated preparation (Allen and Hanburys) is now on trial.

AT a meeting of the section of neurology on May 2, with Dr. J. PURDON MARTIN, the president, in the chair, a discussion on the

Surgical Treatment of Myasthenia Gravis

was opened by Mr. GEOFFREY KEYNES. In his series of 63 cases treated by removal of the thymus, the mortality had fallen from 7 in the first 21 to only 2 in the next 42. Of the 41 cases that remained after excluding 9 recent cases and 13 that had died, 29 were either cured or so much improved that they needed only minimal doses of 'Prostigmin'; only 12 showed little or no improvement. Patients who had been seriously ill before operation had mostly done far better than could be expected from spontaneous remission. The best results were obtained in young individuals with short histories, and the worst in older people with long-standing disease; but all the material was from the severely ill, since the milder cases had naturally not come to operation. The results were inexplicably erratic. Ptosis in particular tended to remain, even when other symptoms had improved. It was clearly advisable to operate early when the general condition was still good and the possible development of a thymoma could be forestalled. One in 10 of these cases had associated thymic tumours, which were adherent to the pleura and difficult to remove and which adversely influenced the prognosis for no very clear reason; there might be relief for a month or two and then sudden relapse and death. In non-tumorous cases the size of the gland was not related to the operative result or to the histological findings after removal. It had been said that the disease did not occur in children, but two moribund infants, aged 2 and 4 years, had been almost literally snatched from the grave by operation.

Dr. D. H. COLLINS remarked that the normal thymus was unfortunately not a familiar entity; the ordinary postmortem specimen was worthless, and only fresh material from young adults who had died suddenly was of any use. In myasthenia gravis gross structural abnormality was the exception, but the histological characteristics of a myasthenic gland could now be distinguished with fair certainty. There was an unusually dense concentration of lymphocytes in the cortex of the residual islets; and within the medulla were formed structures which resembled the germinal centres of lymph-glands, with clear areas and mitotic and vacuolated, almost syncytial, lymphoid cells. These changes were present in 66% of the non-tumorous myasthenic glands, but their meaning was obscure, especially since the normal functions of the organ were unknown; they might be the result rather than the cause of the disease.

Sir CHARLES SYMONDS said there was no question that the operative results were incomparably better than those of medical treatment, though the infrequency of the disease made assessment difficult. Of 30 cases seen before the war, only 2 were known by him to be still alive; one of these had been slightly improved by operation, while the other was an instance of the exceedingly rare spontaneous remission.

Dr. L. P. E. LAURENT, on the basis of 65 personal cases observed over 18 years, was more optimistic. He suggested that natural remission was perhaps not so unusual; he had known several patients who had recovered spontaneously and subsequently led a long and busy life. It was possible that Keynes's successes might be due to early operation, for remission was known to be commoner in early cases. Nor did thymectomy throw light on the fundamental observation by Dr. Mary Walker that in myasthenia a substance is liberated into the bloodstream from the contracting muscles which still further depresses the myoneural junction.

The PRESIDENT pointed out that a number of questions remained to be answered before the value of operation could be properly assessed. The previous mortality was unknown; nor did we know the previous rate of spontaneous remission or the fate of non-operated controls. It might be that some patients unresponsive to operation had remissions later. He was convinced that the operation was a great advance, especially in the treatment of cases which had previously been the most fatal. But thymectomy was not a cure; nor could it be said that myasthenia depended entirely on the thymus. Of the acute cases of myasthenia, the vast majority were fatal, and most of these deaths occurred before the age of 25; it was these younger patients who were most benefited by operation, which was often a dramatic and life-saving procedure. But when myasthenia had passed into the chronic stage, thymectomy caused little relief, and any later improvement was probably due to spontaneous remission.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

AT a meeting in Leeds on April 5, a discussion on

Treatment of Cancer of the Cervix Uteri

was opened by Mr. D. W. CURRIE. He described a series of 41 cases on which he had performed a Wertheim's hysterectomy with no primary mortality. Of these, 8 had died of the disease; 6 of the 11 that had undergone operation five or more years ago were still alive. He considered that this operation was the treatment of choice in early cases, and that it should be preceded by treatment with radium to clear up sepsis and to minimise the risk of implantation of cancer cells in the vault of the vagina.

Dr. G. W. BLOMFIELD emphasised the importance of obtaining a reliable opinion on the likelihood, judged by biopsy, of the cancer cells reacting favourably to radiation. He suggested consultation between the gynæcologist, radiotherapist, and pathologist before the form of treatment was decided.

Mr. CURRIE deplored the fact that many patients were sent for treatment with radium without a gynæcologist's opinion on the advisability of operation.

Members expressed the view that Mr. Currie's figures proved that the risk of a Wertheim's hysterectomy, when performed by an expert surgeon, was no greater than that of an ordinary hysterectomy.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting on April 25, with Dr. G. F. RAWDON SMITH, the president, in the chair, papers were read on

Penicillin in Subacute Bacterial Endocarditis

Dr. G. SANDERSON described 20 cases treated on behalf of the penicillin clinical trials committee of the Medical Research Council.[1] Of these, 8 had died, and 12 had survived for periods ranging from a few weeks to over a year. Of the 8 female cases 5 had died, and of the 12 males 3 had died. Three cases with congenital heart disease had all done well. It was impossible to estimate with any precision how patients would react to treatment. Penicillin was given in the earlier cases by continuous intramuscular drip, and subsequently by 3-hourly intramuscular injections into the thigh. Patients much preferred the latter technique.

Major embolic accidents had occurred in 7 cases. One patient, who had a subarachnoid hæmorrhage during treatment, has residual diplopia and difficulty in walking. A second patient developed during convalescence recurrent massive hæmaturia; a left renal aneurysm was found at operation for nephrectomy, after which the patient recovered completely. These 2 cases illustrated "recovery with sequelæ." Physicians and surgeons would need to be aware of this new syndrome, which sometimes occurred in successfully treated cases. Consideration of the 8 cases that had died indicated that most deaths were not due to failure of penicillin, and suggested that even with optimum dosage a considerable mortality—probably about 25%—must still be anticipated.

Of the Liverpool cases treated with 500,000 units daily for ten days, 3 out of 5 had recovered; but no other centre had had any success with this regime. The present tendency was towards larger doses over longer periods.

Dr. M. G. MCENTEGART drew attention no the apparent lack of correlation between the coefficient of resistance of the infecting organism (within the limits

1. See *Lancet*, March 16, 1946, p. 369.

shown by organisms isolated from Liverpool cases) and the ultimate outcome. Observations on serum penicillin levels suggested that the onset of renal failure was accompanied by some degree of penicillin retention.

The PRESIDENT commented on the greater success in the earlier cases than in the later ones. Penicillin might be partially responsible for the emboli so often observed. It was surprising that extensive dental extractions were considered an ætiological factor in infective endocarditis, since this was not recognised at the Liverpool Dental Hospital.

Dr. H. FULD said that one patient, who had been seen by him before admission to hospital with infective endocarditis, had had a tooth extracted for apical abscess three weeks before the onset of symptoms. He felt that dental surgeons should be acquainted with the relationship between oral sepsis and subacute bacterial endocarditis, which had been emphasised in America.[2] In future "oral clearance," particularly in patients with congenital heart disease or with a history of rheumatic fever, should be considered an operation requiring pre- and post-operative penicillin therapy. Total clearance at one sitting should now be a matter of the past. He inquired if in Dr. Sanderson's series suspected teeth had been removed before treatment was completed, in order to diminish the threat of reinfection of the heart valves.

Dr. R. M. EVANS recalled 2 cases of apparent cure in which sudden onset of congestive cardiac failure several weeks after the end of penicillin treatment was found at autopsy to be due to a ruptured aortic cusp. Vegetations were found in neither case. The bacterial infection had apparently been abolished, but had left the cusps damaged by scarring.

Reviews of Books

Pulmonary Edema and Inflammation

CECIL K. DRINKER, M.D., D.SC., professor of physiology, Harvard University, Boston, Mass. London: Oxford University Press. Pp. 106. 14*s*.

PULMONARY œdema produces such serious symptoms, and when it develops suddenly, such alarming effects, that understanding of the mechanism of its development is of great practical importance. This monograph, embodying the Nathalie Gray Bernard lectures, is the result of long experimental and clinical studies by Professor Drinker and his co-workers. He maintains that the endothelial lining of the pulmonary capillaries is particularly vulnerable to anoxia. This endothelium depends for its oxygen-supply on the air reaching the alveoli, and not, as in the capillaries of the rest of the body, upon oxygen brought by arterial blood. When transudates or exudates escape into the alveoli and reach the bronchioles, air is excluded from the alveoli and the local anoxia increases capillary permeability. Such exudates and transudates depend for their removal on the lymphatics, which are extensive in the lungs though they do not reach the actual alveoli. The right lymphatic duct, on which they converge, is small enough to form a bottleneck for lymph drainage from the lungs. He accepts the idea of alveolar pores or communications between adjacent alveolar groups, and thinks they mitigate the effects of bronchiolar obstruction.

Among physical factors promoting escape of fluid through the capillary walls he discusses the relatively insignificant arteriolar circulation from the bronchial arteries, the enormous capillary area—estimated at about 140 sq. metres—with its low capillary blood-pressure, and the variable negative intrathoracic pressure which tends to draw fluid out of the pulmonary blood-flow. Some ingenious experiments demonstrated that increased pressure in the pulmonary capillaries does not readily cause pulmonary œdema, unless it is associated with increased endothelial permeability, usually the result of anoxia. A substance allied to thiourea was found to induce fatal pulmonary œdema with pleural effusion when injected into dogs. Using it Professor Drinker demonstrated than when pulmonary capillary leakage of protein-laden fluid is excessive, lymphatic drainage from the lungs by the right lymphatic duct becomes gravely inadequate. He advocates changing the position of the patient in bed, and recalls that a few deep breaths will prevent stasis and atelectasis, the common antecedents of œdema. Oxygen, he believes, should be used early, and thinks that the patient with irritative conditions, due to inhaling chlorine or other irritating gases, may be helped by breathing oxygen under pressure. Finally, he discusses the methods of artificial respiration, including mechanical appliances like the Bragg-Paul, the London County Council cuirass, and the Drinker-Shaw respirators. The book is a thoughtful, interesting, and suggestive contribution to a difficult subject.

2. Favour, C. B., et al. *New Engl. J. Med.* 1946, **234**, 71.

Textbook of Medical Treatment

(4th ed.) Editors: D. M. DUNLOP, M.D., F.R.C.P.E., professor of therapeutics and clinical medicine, University of Edinburgh; L. S. P. DAVIDSON, M.D., F.R.C.P., professor of medicine and clinical medicine, University of Edinburgh; J. W. MCNEE, M.D., F.R.C.P., regius professor of medicine, University of Glasgow. Edinburgh: E. & S. Livingstone. Pp. 923. 30*s*.

THE new edition of this deservedly popular work from the Scottish school of medicine well maintains the standard of its predecessors, and for a textbook produced under present conditions is remarkably up to date. Penicillin, thiouracil, and D.D.T. are all covered, though there is no reference to methyl thiouracil; thrombophlebitis is only mentioned indirectly and little enthusiasm is shown for the use of heparin. The index contains two "sins"—one of omission and one of commission—scarcely in accord with the best Scottish traditions: "angina pectoris" is not to be found, while "angina innocens," a term which is anathema to cardiologists, is perpetuated. The table of official preparations and their proprietary equivalents, though incomplete, is retained. For reliability and clearness this continues to be a textbook of choice for both student and practitioner.

Green-Belt Cities

F. J. OSBORN. London: Faber. Pp. 191. 12*s*. 6*d*.

MUCH has been written on green belts in the past few years. Amid the clashing swords of the experts the public is fast becoming confused rather than enlightened, and it is refreshing, therefore, to turn to this book by Mr. Osborn, who is in the true succession from Ebenezer Howard with whom he worked. Indeed, he has developed the thesis in greater detail than Howard himself, and it would be difficult to better his succinct and complete survey of town and country planning for social and industrial life. The green-belted garden city seems to be the only rational plan for a highly industrialised country such as ours. We cannot reconstruct our large old cities without building new towns for those we disperse in the process. In correcting the worst consequences of the industrial revolution, we must sweep away large areas of drab and insanitary dwellings in our great cities. Mr. Osborn regards the Greater London plan of 1944, compiled under the guidance of Sir Patrick Abercrombie, as the first fully worked out garden-city plan for the metropolis. The appendices of his book trace the historical origins of the green-belt principle back to the days of Moses.

Lumbalgien

Dr. Med. HANS DEBRUNNER, Privatdozent für Orthopädie an der Universität Zürich. Berne: Huber. Pp. 106. Sw. Fr. 9.50.

Dr. Debrunner aims at giving an adequate survey of the problem of low back-pain as seen by the orthopædic surgeon; and his clear and well-illustrated account succeeds in doing this. Every aspect of the subject is covered, though the emphasis on each does not always accord with current trends in this country and the United States—a difference which may be the result of the relative isolation of Swiss surgery during the war years. More stress is laid on the importance of developmental errors in the lumbosacral region and on soft-part disorders—myalgia and periostitis—than is customary here; whereas the section on the intervertebral disk seems somewhat inadequate. Dr. Debrunner regards degeneration (or osteochondrosis) of the 5th lumbar disk, with narrowing of the lumbosacral interval and local symptoms, as an entity separate from retropulsion of the nucleus.

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**Lancet (1942) 2, 275. Brit. med. J. (1945) 1, 75.*

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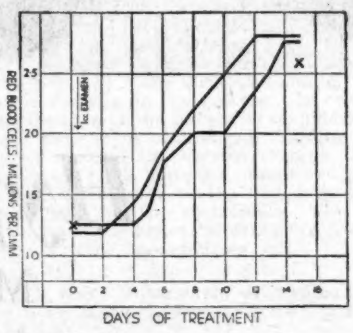

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THE LANCET

LONDON: SATURDAY, MAY 18, 1946

The Practitioner's Income

THE Spens Committee recommends that in a National Health Service the large majority of general practitioners should have higher incomes than they have earned hitherto. In forming this opinion it made use of Prof. A. BRADFORD HILL'S analysis of 3000 replies by practitioners to a questionary sent out by the British Medical Association; and though (as Prof. BRADFORD HILL emphasises in his statement) a third of those questioned did not give the required information, the committee thinks that the mean incomes revealed are unlikely to be far wrong. It appears that in the three years 1936–38 the mean net incomes of male doctors practising as principals were as follows:—

Ages ..	–34	35–39	40–44	45–54	55–64	64+
Urban areas	£959	£1158	£1175	£1220	£1006	£754
Mixed areas	£1012	£1192	£1256	£1255	£1260	£728
Rural areas	£839	£1038	£975	£1063	£928	£797

All these means lie between £700 and £1300, but the individual range was of course far greater; thus in urban areas there were 25 returns of net incomes below £100 and 4 of net incomes above £4000. The essential fact on which the committee fixes is that (again in urban areas) nearly 20% of doctors of 40–55 years of age were earning less than £700 a year (net), while over 40% had less than £1000. "Having regard to length of training, to the arduousness of the general practitioner's life compared with that in other professions, to the greater danger to health, to the skill and other qualities required, and to the degree of individual responsibility" the committee holds that too many were receiving low incomes and that too few were able to reach £1300 a year (net) or more. The kind of distribution of incomes which the committee (with one dissentient) thinks desirable could have been reached before the war by adding £200 to incomes of £400–£1200, and a progressively diminishing amount to incomes of £1200–£2000; and the result of applying this formula is seen in detail in table B, summarised on p. 748. Writing in terms of the 1939 value of money, the committee illustrates its recommendation as follows:

> "The effect of our proposals can be put very simply by saying that between 40 and 50 years of age approximately three-quarters of general practitioners ought to have achieved a net income of over £1000 per annum, approximately half ought to have achieved a net income of over £1300 per annum, approximately a quarter ought to have achieved a net income of over £1600 per annum and slightly less than 10% a net income of £2000 or over."

While it refrains from any attempt to translate these money figures into their post-war equivalents, we may presume that if its intention is to be fulfilled they would have to be augmented substantially and so become distinctly more attractive. With additions of one-third, for example, the above sentence would read:

> ". . . between 40 and 50 years of age approximately three-quarters of general practitioners ought to have achieved a net income of over £1333 per annum, approximately half ought to have achieved a net income of over £1733 per annum, approximately a quarter ought to have achieved a net income of over £2133 per annum and slightly less than 10% a net income of £2666 or over."

To the many doctors who are accustomed to think of their gross incomes rather than their net profits, these figures may seem less impressive than they really are. To arrive at their equivalent in gross incomes we must add a proportion for expenses; and Prof. BRADFORD HILL'S analysis revealed no group in which the mean expenses of practice were less than a third of the total earnings. Allowing this minimal third of the gross income for expenses, and another third to compensate for the depreciation of money, the committee's net incomes of £1000, £1300, £1600, and £2000 at 1939 values would be worth the same amount as gross incomes of £2000, £2600, £3200, and £4000 today.

The committee justifies a "very considerable increase" in the total net income of practitioners largely on the ground that "even apart from any complications resulting from the general introduction of a publicly organised service, we do not believe that a profession involving the arduous life and the heavy responsibilities of general practice could permanently maintain its recruitment in present conditions, either as against other professions or as against other branches of the medical profession, with so high a proportion of low incomes in middle age as the payments before 1939 in fact produced." The dangers are first that the best recruits will not enter medicine at all, and secondly that all those who do so will decide to be specialists. These arguments, however, do not convince the dissenting member of the committee, Sir ERNEST FASS, who has Treasury associations. The fact that we are to have a National Health Service is, he believes, "no cause for varying the relativities either between the professions or within the medical profession itself." Having in mind the salary scales laid down last autumn for doctors working in the hospitals of the Middlesex County Council, he suggests that, in terms of 1946 money, 50% of practitioners should earn less than £1200, and 80% less than £1800, while 7·5% should get more than £2200 and 2·5% more than £2500.

Although the committee was not asked to consider *how* practitioners should be paid, its report is highly relevant to this problem. Many have expected that it would propose a scale of remuneration on which incomes would rise according to seniority, recognised merit, or special qualifications. But it favours nothing of the kind: "we are satisfied that there is a far greater diversity of ability and effort among general practitioners than admits of remuneration by some single scale applicable to all." The "most obvious method" of securing differentiation of earnings according to ability and effort is payment partly or wholly by capitation fees, and while the committee expresses no opinion whatever on the merits of this method it endeavours to show how the capitation system can be made to yield the improved distribution of incomes which it desires. Certain special arrangements

are recommended to reduce the differences between urban and rural practices; it is proposed that the Highlands and Islands scheme should be applied to other sparsely populated areas; additional remuneration will be needed for unattractive localities; and adjustments will be required at health resorts or other places where doctors look after an altogether abnormal number of invalids and old people. Leaving these particular problems for particular solution, the main difficulty of payment by capitation arises at the top and bottom of the income range. At the bottom it could be met if practitioners could qualify for "some augmentation of income which was independent of capitation"; for example, a bonus of £100 could be paid to those who have attended a refresher course within the last three years, or a grant could be made towards professional expenses where these represent an abnormally high proportion of receipts. But, at the top of the income range, how could we maintain the proportion of practitioners earning over £2000 a year, net, at pre-war rates? In a public service the number of patients that a single doctor can be allowed to look after must be limited; and "this number may well not be sufficiently large to provide high incomes in the absence of a considerable amount of private practice." Unlike the Government white-paper, which suggested a diminishing capitation-rate as the doctor's list grows, the Spens Committee is at pains to see how he can be additionally rewarded for special popularity with the public. And its answer is—by taking an assistant. The committee would like to see every newly qualified doctor—and certainly every recruit to general practice—spend at least a year as assistant to an established practitioner, who would pay him £500 for the first year and £600 for the second. While every practitioner would be free to engage an assistant on these terms, some 10%, selected because of their success in practice and general suitability, would be encouraged to do so by receiving a supervision fee of £100 a year. Since, however, it would take time to enlarge a practice sufficiently to bear the expense of paying an assistant £500 a year (plus perhaps £250 expenses), it is suggested that a practitioner who has been approved for this purpose and who has not previously had an assistant should receive, besides the £100 supervision fee, a subsidy of £500 in the first year, £300 in the second, and £100 in the third. "We believe that some such system would improve training, would enable the most successful practitioners to treat or supervise the treatment of considerably more patients, thus making their services more widely available, and would meet the difficulty we anticipate in securing that incomes substantially over £2000 will continue to be obtainable in general practice."

The cost of these payments, for a service covering 45 million people, is put at 15*s*. 6*d*. a head, of which 6*d*. is for special purposes and 15*s*. for the ordinary remuneration of the practitioner. If such remuneration were solely by capitation, the fee payable would thus be 15*s*. in 1939 money, or £1 if this were increased by a third to give a corresponding value for 1946. But in all these calculations we are of course going too fast if not too far. In the first place the Treasury is not unlikely to resist any suggestion that the addition of as much as 33% is necessary because of the rise in prices during and since the war, and the Government may not agree that there is a special case for improving the lot of general practitioners as a whole. The Spens Committee is purely advisory, and the MINISTER OF HEALTH has yet to begin his promised conversations with the profession on its findings. Whatever the outcome, however, we can be grateful to the committee for its discernment and understanding. The general practitioner of medicine bears a heavy burden of work and responsibility which will not be appreciably lightened for years to come; and his material rewards have been generally too low in relation to his training, skill, and unending labour. Sir WILL SPENS and his associates have recognised these facts, and have pointed out the risk that this calling may cease to attract the best men and women:

> "General practice is the foundation on which all else is built. If its recruitment is not maintained—alike in quantity and quality—both as against other professions and against other branches of the medical profession, no other health service, specialist or hospital service, however excellent, can make good the loss . . ."

Those whose aim is to build a better service will surely take heed of these words.

Threadworms

THE anal swab introduced by HALL,[1] now known as the National Institute of Health (N.I.H.) swab, has proved its value in the diagnosis of threadworm infestation. It consists of a piece of 'Cellophane' 25 mm. square folded over the end of a glass rod and held in place by a rubber band. The perianal skin is stroked with it and the cellophane is then removed and mounted in water or *N*/10 NaOH and examined for enterobius eggs adhering to it. The swab can be enclosed in a glass tube for transport to a laboratory. Used with care and experience, this swab gives reliable results, and it seems to be preferable to similar swabs made of other materials, such as Scotch tape. But the proportion of positives still depends on how often the swabbing is repeated.[2]

SCHÜFFNER and SWELLENGREBEL,[3] working in Amsterdam, where all the children are, they say, infected with *Enterobius vermicularis*, have observed that the female threadworm lays her eggs in a stream and that most of the 10,000–15,000 eggs of each female may be laid in a few minutes, forming dense heaps or clusters. Because of this clustering, and because the movements of the female are feeble before she dies when egg-laying is completed, the eggs may not be widely distributed over the perianal skin, so that the swab may pass between clusters and fail to detect their presence. For this reason light infestations especially may be missed. SCHÜFFNER and SWELLENGREBEL therefore devised a new method. Having wetted the perianal skin they massage it for 15 seconds with the finger to make an emulsion of the squamous cells, sweat, mucus, and fæcal matter present. Drops of this emulsion are then taken up with a small pestle, made by blowing out the end of a piece of thick-walled glass tubing, 10 cm. long, into a globe with a diameter of 1¾ inches; the lower half of this globe is ground rough to enable it to

1. Hall, M. C. *Amer. J. trop. Med.* 1937, **17**, 445.
2. Cram, E. B. *Amer. J. Dis. Child.* 1943, **65**, 43.
3. Schüffner, W., Swellengrebel, N. H. *Zbl. Bakt.* I Abt. Orig. 1943, **151**, 71; Abstr. in *Trop. Dis. Bull.* 1945, **42**, 922.

dislodge material between the perianal folds. The drops of emulsion are transferred to slides for examination. They can be dried on the slides for transport to a laboratory, where they are again wetted with water or NaOH, but a better method is to mount them in cedar-wood oil; the oil does not clear the eggs, which appear like air bubbles. Its inventors claim that with this pestle method examination takes only about a third of the time taken with the N.I.H. swab. They examined 50 subjects with the N.I.H. swab in 578 minutes and the same 50 in 172 minutes with the pestle; this time included mounting the slides, which is not necessary for diagnosis. The examination of possibly negative subjects (e.g., after treatment) takes three to six times as long with the N.I.H. swab, because the whole of the cellophane strip must be searched. When 50 subjects were examined with the N.I.H. swab and then with the pestle, only 37 were positive with the N.I.H. swab, in spite of the fact that this was used first, whereas all 50 were positive with the pestle. Moreover, the pestle recovered four times as many eggs as the swab (3372 compared with 931), though from one subject the swab recovered 201 eggs to the pestle's 2, perhaps because the swab chanced to take up a cluster. The Americans [2] recommend 7–10 re-examinations with the N.I.H. swab before a negative result is accepted. SCHÜFFNER and SWELLENGREBEL claim that fewer re-examinations are needed with the pestle. They also claim that the pestle is simpler to use and is more easily cleaned and that it does not scratch the perianal skin as the sharp folds of the cellophane may do.

The Amsterdam workers have also [4] examined nail dirt and house dust for eggs of enterobius. They do not agree with the view that examination of nail dirt can replace that of the perianal skin in diagnosis—certainly not when children wear pyjamas at night. From their study of dust they conclude that the eggs are blown about everywhere, so that the height of the surface examined from the floor is immaterial. Large numbers of eggs were recovered from the dust of closets and school dining-rooms, but most of these eggs were empty and could not develop into adult worms; NOLAN and REARDON [5] found that 92% of eggs recovered from dust are not viable, but CLAYTON LANE [6] pointed out that the wetter and cooler the air the longer eggs will survive. SCHÜFFNER [7] says that the main source of eggs in dust is the anal region. Out of doors most of the eggs which pass into the air are lost, but indoors many are deposited in dust. The number of eggs found on a square foot of surface was 119 in a large school dining-hall, 305 in classrooms, and 5000 in closets. More eggs were found in girls' closets, although the girls were not more heavily infested than the boys. SCHÜFFNER suggests that the movements of female clothes favour the dissemination of eggs. These enclosed spaces are, however, used only for short periods. There is one even smaller space in which we spend half our lifetime—beneath the bedclothes—and this is an important source of air-borne infestation. Bed-making also favours dissemination of eggs. Dust-borne infestation is important, but it causes only light infestations. If, however, finger infection is added to it, a light infestation may become severe and active.

There is no satisfactory treatment of the threadworm carrier, who may be seriously worried at night by only one worm. We must try to limit the degree of infestation much as we try to limit infestation with hookworms in areas where it cannot be wholly prevented. For the relief of anal irritation SCHÜFFNER recommends small enemas of 30–50 c.cm. of water. Or the anus may be closed at night with ointments or suppositories. Discussing the frequency of enterobiasis in Germany during the war, which, together with air-raids, led to a serious loss of sleep and consequent loss of productive power, OXENIUS [8] recommends that a small cotton-wool compress smeared with benzocaine ointment and then dipped in benzocaine powder should be inserted into the rectum overnight. SCHÜFFNER condemns high enemas designed to get at the worms higher up the intestine; these should be treated with anthelmintics, of which gentian-violet seems to be the most effective, though it is by no means free from side-effects. Finger infection can be combated by cleanliness and washing the anal region immediately after rising, so that the child is provided with a personal "climate" more or less free of eggs during the day. Closely fitting drawers are worn at night. Such measures as treating the rest of the family, washing the anal region in the middle of the night, daily changes and sterilisation of bedclothes and underclothes, high enemas, changes of diet, and purges are all condemned by SCHÜFFNER because they may lead to threadworm neurosis in the mothers as well as in the children.

Surgery of Banti's Syndrome

WE used to be taught that Banti's disease, or splenic anæmia, was caused by an unknown toxin, that it started in the spleen giving rise to splenomegaly, and that it spread mysteriously to the liver to cause an atrophic cirrhosis. It was maintained that the anæmia was due to the hypothetical toxin and was aggravated by the gastro-intestinal hæmorrhages which resulted from portal obstruction. Many surgeons thought splenectomy, if done in time, cured the disease, but it did not always arrest the progress of symptoms. Cases were seen which resembled but did not tally exactly with Banti's original description. A condition like it was produced if the portal vein thrombosed, and similar symptoms were found to be caused by infestation with *Schistosoma mansoni*. The prevailing uncertainty was reflected in the adoption of the term Banti's syndrome to describe the splenomegaly, the anæmia, the gastro-intestinal hæmorrhages, the increasing hepatic damage, and the ascites which formed such a striking clinical entity.

Much light has been thrown on the problem by the work done at the spleen clinic of the Columbia-Presbyterian Medical Centre, lately reported by WHIPPLE.[9] It is now thought that Banti's syndrome is always due to portal obstruction, and that its hitherto puzzling variations—the varying speed of its course and the apparently unpredictable results of

4. *Ibid*, 1944, **151**, 114; Abstr. in *Trop. Dis. Bull.* 1945, **42**, 924.
5. Nolan, M. O., Reardon, L. *J. Parasit.* 1939, **25**, 173.
6. Lane, C. *Lancet*, 1944, ii, 511.
7. Schüffner, W. *Münch. med. Wschr.* 1944, **91**, 411; Abstr. in *Trop. Dis. Bull.* 1946, **43**, 233.
8. Oxenius, K. *Ibid*, 1944, **91**, 414; Abstr. in *Trop. Dis. Bull.* 1946, **43**, in the press.
9. Whipple, A. O. *Ann. Surg.* 1945, **122**, 449.

splenectomy—depend on where and why the portal vein is obstructed. The more striking symptoms are always due to portal hypertension. The portal block may be intra- or extra-hepatic. Cirrhosis of the liver, the ætiology and classification of which is now receiving much attention, is responsible for intrahepatic portal obstruction and can be diagnosed with fair certainty if liver-function tests show hepatic insufficiency. The extrahepatic course of the portal vein may be obstructed by traumatic fibrosis of the pancreas, of which WHIPPLE records an interesting example; by thrombosis of the splenic vein, when a previous history of pancreatitis may provide a pointer; by cavernomatous transformation of the portal vein, a condition which must be new to most of us and on the cause of which WHIPPLE is not prepared to dogmatise; by congenital strictures in the region of the portal fissure, due to overactive closure of the fœtal ductus venosus and umbilical vein; or by the pressure of neighbouring abscesses, cysts, and tumours. The exact site of an extrahepatic block can seldom be decided before operation and often not even when the abdomen is open, but if the block is extrahepatic a patient may suffer from Banti's syndrome for years without showing pathological changes in the liver. The workers at the spleen clinic, among other fundamental work on the portal and splenic circulation, have produced experimental cirrhosis in dogs and seen the dogs progress to Banti's syndrome. From these animal experiments, and from observations with intravenous cannulæ on human beings at operation, they have found that the normal portal pressure of 80 mm. of water may be raised to as much as 500 mm. of water, the rise depending on the degree and speed of the portal obstruction and the ability of the patient to open up collateral channels.

Splenectomy for Banti's syndrome, the results of which have been so uncertain, will cure those cases in which the splenic vein only is obstructed, provided the left gastric vein does not open anomalously into the splenic vein. Obstructions at this site are rare, and if splenectomy is done for more proximal obstructions useful collateral channels may be damaged. Operations of the Talma or Morison variety, done to provoke traumatic adhesions and additional collateral vessels between the viscera and the parietes, have not often been successful. The injection of an œsophageal varix through an œsophagoscope will only block an important collateral channel. A number of attempts, with an occasional success, have been made to anastomose portal and systemic veins—e.g., the ovarian to a branch of the superior mesenteric. WHIPPLE now records that he has anastomosed the portal and systemic circulations in 10 cases of Banti's syndrome without an operative death. His success has been due to his coöperation with BLAKEMORE and LORD [10] in applying the latter's non-suture method of blood-vessel anastomosis to the portal system. This technique is now well known: the cut end of a vessel is threaded through a shouldered 'Vitallium' tube and turned back as a cuff over the end of the tube; the rigid endothelial lined channel thus formed is then tied into the recipient vessel, on either the end-to-end or end-to-side principle. The first 5 of WHIPPLE's cases were end-to-end anastomoses of the splenic to the left renal vein, after splenectomy and left nephrectomy had been done. The last 5 were end-to-side anastomoses of the portal vein to the vena cava. Of these 10 cases, 6 have shown remarkable improvement and it is clear that a man with an Eck's fistula can live as happily as a dog with one. These procedures are as yet purely experimental and have been carried out only in patients who have had repeated hæmorrhages and for whom conservative measures offered no hope. But the results are of great interest to both the surgeon and the physiologist. It is to be hoped that suitable vitallium tubes will soon be available in this country to give those suffering from an advanced Banti's syndrome their only hope of survival.

10. Blakemore, A. H., Lord, J. W. *Ibid*, p. 476.

Annotations

CELEBRATION

IN 1923 the Royal Hospital of St. Bartholomew celebrated the 800th anniversary of its foundation with festivities lasting three days. In 1946 the same hospital has just celebrated, more modestly as befits the times, the 400th anniversary of its second foundation. During the reign of King Henry VIII the hospital, founded with the help of his ancestor King Henry I, had fallen on very evil times, having suffered, together with its parent priory, confiscation of its property and income. The hospital came near to passing out of existence, until at the eleventh hour King Henry VIII was persuaded to undo part of the harm he had done by granting a royal charter for its refoundation. This was in 1546 when Henry was himself a sick man, and so the more ready to listen to the petition of the people of London, who found they were unable to do without their already ancient hospital. So Henry the Destroyer became also Henry the Founder, and his memory is held in honour in the hospital today.

On May 8, 1946, before a large and distinguished audience which included the King and Queen, were enacted some episodes in the history of the hospital. The commemoration was held in the Norman Priory Church of St. Bartholomew the Great before the tomb of Rahere, the first founder; and a more remarkable setting for such a ceremony can hardly be imagined. At eleven o'clock a procession was formed in the hospital by representatives of various bodies and institutions, including the Royal Colleges of Physicians and Surgeons, many City companies, the Lord Mayor of London with aldermen and sheriffs, and past and present members of the staff of the hospital, both lay and professional. This procession in academic scarlet and civic robes of many colours filed into the church, and at noon Their Majesties entered in their turn.

The commemoration service was preceded by four episodes, directed by Mr. Robert Atkins, dated 1546, 1123, 1946, and 1546. In the first a lay brother, one of the last representatives of the destroyed monastery, bewails its decay and calls on the spirit of Rahere to save his hospital. King Henry then enters with Queen Katherine Parr and petulantly complains of the crying of a sick child outside the church. The Queen tries to persuade him that perhaps he has not done quite right in depriving the people of London of their hospital, but the King goes out without promising any redress. The second episode goes back to 1123 with Rahere the Jester in Rome, turned priest and penitent by fear of death and promising to perform good works if he recovers. To him appears a vision of St. Bartholomew himself, standing in an arch of the triforium and telling Rahere what he must do. In the third episode a British R.A.F. pilot and an American officer of 1946 are looking round the church and recalling how it has almost miraculously

survived the dangers of the years of war. They pause in front of the tomb of Rahere, who appears to them, and tells them of its foundation and how St. Bartholomew himself had promised that it should be protected by his wings. The fourth episode returns to 1546 with King Henry, now himself a very sick man, eager to restore the hospital by granting a royal charter, though he cannot bear to listen to the tedious reading of its terms by the clerk. He finally signs it and staggers out, soon to die, the accomplishment of the refoundation being signalised by a fanfare of trumpets echoing through the Norman arches of the most splendid choir in London.

In bald recital the brief pageant may sound too slight to be distinguished; but it was in fact a beautiful and moving spectacle. King Henry was finely represented by Mr. Robert Morley, the Queen by Miss Viola Lyel, Rahere by Mr. John Byron, and St. Bartholomew by Sir Lewis Casson.

The episodes were followed by a short commemoration service, which included an address by the Very Rev. Garfield Williams, M.B., dean of Manchester, who was himself a student of the hospital. Dr. Williams made many interesting observations on the part likely to have been played by Thomas Vicary, the King's surgeon, in the refoundation, and the reasons which may have influenced the King in undertaking it. Prayers were offered by the hospitaller, the Rev. D. F. Donne, by Canon E. S. Savage, and by the rector of the Priory Church, the Rev. N. E. Wallbank. The musical programme was directed by the organist of the church, Nicholas Choveaux.

At the end of the service the company dispersed; but the hospital had not concluded its celebrations. It was commemorating also the 600th anniversary of View Day, when the whole hospital is thrown open to visitors, the 150th anniversary of the foundation of the Abernethian Society, the 100th anniversary of the introduction of chloroform into the hospital, the jubilee of the use of X rays in the hospital, and the first anniversary of victory in Europe. During the afternoon hundreds of friends and old students of the hospital visited the wards and departments, which have mostly survived the destruction of the war years, and enjoyed an exhibition in the college library of some of the hospital treasures, including King Henry's charter bearing his signature, and dated 1546, a deed witnessed by Rahere in 1137, and the celebrated cartulary written by brother John Cok in the reign of Henry VI. There was also an exhibition of books and documents connected with John Abernethy, including a lovely miniature portrait lent by the Royal College of Surgeons, and "side shows" illustrating the history of anæsthesia and X rays.

It had not been possible to clear away all the dirt and rubble accumulated during the war years, but it was evident that the Ancient and Royal Hospital is again raising its head after its years of service as a casualty-clearing station. The only regret was that the moving spirit of the whole occasion, Mr. McAdam Eccles, was himself lying ill in the wards of the hospital and was unable to take part in the proceedings.

THE WORLD'S FOOD

THE April issue of the *Nutrition Bulletin*[1] analyses the world food situation. It says that Russia has expanded her grain production in the areas that were not occupied, but the last harvest in the liberated areas amounted at best to 80% of the pre-war average. There has been a serious shortage of tractors and draught animals, as well as fertilisers of animal origin. Russia is transferring 1½–2 million tons of grain to Poland, the Danubian countries, and France. Britain, which is not a food-exporting country, has surrendered only a few thousand tons of potatoes; the 900,000 tons of food sent to the Continent in 1945 was stock from overseas that was built up here for the purpose of relief.

The two main factors that have produced the world food shortage are war destruction and drought, but the position has been further complicated by floods in China, New Zealand, and Queensland. Apart from these unpredictable adversities, however, we have failed to estimate the probable yields and the probable demand for grain. Estimates of stocks had to be drastically revised downwards at the end of last year; the error seems to have been due partly to miscalculation of the amount of wheat likely to be fed to livestock in the North American countries, and partly to weakness in the statistical methods. No serious measures were taken to replenish the reserves of grain, which were rapidly diminishing throughout 1945. In Britain the policy of ploughing up the land was reversed, more grain was fed to stock, and the extraction of flour was lowered from 85% to 80%. In the great wheat-producing countries the acreage under wheat was about 16% below what it had been in 1938. Governments and farmers in these countries hastened to reduce their large reserves, which they considered might be unmarketable after the end of hostilities; much was either fed to stock or converted into commercial alcohol for the manufacture of rubber; and in the Argentine a large amount was used for fuel. We are paying today for the restrictionist farming policy which was accepted by all the main producing countries before the war. The only possible solution would have been the establishment, after the Hot Springs conference of 1943, of a supreme inter-allied council to decide the programme of food-production. As it was, the Combined Food Board in Washington continued to represent only Britain, Canada, and the U.S.A. At no time did UNRRA have any decisive voice in cropping and production programmes or in allocation. The new International Food and Agriculture Organisation was not in existence at the end of the war, and control passed virtually into the hands of Canada and the U.S.A.; since September last, probably three-quarters or more of the exportable surplus of wheat has lain in the North American continent.

The U.S.A. is endeavouring to conserve grain, and to apply to relief all that is available. The next three months will be among the most difficult in the world's history; after that everything will depend on the harvest. An attempt to pass on the blame from one country to another would be fatal. We must accept the warning that the food economy of the world is now so far integrated that it must be studied as a single problem in production and distribution.

AN INTERNATIONAL PHARMACOPŒIA

THE healing art of Hippocrates may recognise no distinction of race or nationality, but the reluctance of civilised man to depart from medieval standards of sovereignty still denies the world an international pharmacopœia. It is over eighty years since the feasibility of compiling such a work was first discussed at the International Congress of Pharmacy; but it was not until 1902 that a conference called by various interested governments was convened at Brussels. This conference drew up the "First International Agreement for the Unification of the Formulæ of Potent Drugs," which was signed by the representatives of 18 countries and was finally ratified in 1906. A second international agreement was drawn up at a conference in Brussels in 1925 and was signed by the representatives of 26 countries; but only 15 governments ratified it, and of these 10 did so with reservations. Among the 41 articles was one designed to provide for an international organisation, under the ægis of the League of Nations, for the unification of pharmacopœias. In 1937 the Health Organisation of the League set up a Technical Commission of Pharmacopœial Experts under

1. From the Children's Nutrition Council, 6, East Common, Harpenden, Herts.

the chairmanship of Dr. C. H. Hampshire, secretary of the British Pharmacopœia Commission. This commission had just got well under way when war broke out in 1939, but as a result of commendable initiative by the British and American representatives, some of the work planned by the commission has been carried out, and the results are recorded in an interim report which has just been published.[1] The principal contents of this report are: (1) a list of drugs giving the usual and the maximum dose, as well as the method of administration; (2) a series of monographs dealing with some of the commoner drugs in use; and (3) an additional list of drugs under study for inclusion in an international pharmacopœia.

Here at last is a definite step in the right direction. The question now is, how much further are we and our fellow practitioners in other countries prepared to go? Ten years ago, in the preface to the first addendum to the *British Pharmacopœia*, 1932, the commission, after drawing attention to the value of coöperation with the Committee of Revision of the *United States Pharmacopœia*, expressed the hope that "this practice, having been once begun, may be continued with advantage to both books." Now that the war is over and UNO is getting into its stride (albeit rather painfully), it is to be hoped that this coöperation between ourselves and the United States will be rapidly expanded to include other countries, and that the Technical Commission of Pharmacopœial Experts, reinforced by representatives of other countries, will be enabled to take up the work from the stage reached by the interim report. The increasing potency of modern therapeutic preparations makes more than ever essential an internationally recognised (and observed) standard of preparation, potency, and dosage.

CARE OF CHILDREN

THOUGH the nation shows a growing regard for children, there are still many ways in which, without invading the parents' province, we might improve our care of them. Rosalind Chambers and Christine Cockburn [2] give a brief factual account of the provisions now made for children in England and Wales, and draw attention to the gaps. As Margery Fry points out in the foreword, too many local-authority services for children are optional, and too many agencies for child welfare are financially starved or served by overworked staff; and it will be too late in twenty years' time to repair the results of our shortcomings today. War measures brought the chance of better nourishment to many mothers and children, but not all mothers have used their opportunities. Thus the "take-up" figures for vitamin supplements for the year ending March 31, 1944, were: fruit juices 54%, cod-liver oil 26%, and preparations of vitamin A and D 43%. During the following year, these figures fell to 42, 21, and 37%. P.E.P., in a broadsheet on child health and nutrition,[3] attribute these unsatisfactory figures partly to distribution difficulties, as well as to lack of knowledge among the mothers. Troublesome waiting or queueing at local food offices or welfare centres deters many who are busy with other home duties; greater variety of vitamin-D products might encourage mothers whose children reject cod-liver oil; but in the long run more fresh fruit and a better understanding of food values by the general population are the things to aim at, provided these are coupled with adequate purchasing power. P.E.P. regard the National Milk Scheme of 1940 as possibly the greatest single measure for child health ever introduced into this country, and think that the special food services for mothers and children should remain part of the national food policy. There seem to be good hopes that this will be so. Milk and school meals will ultimately be free to all children, the free milk service coming into force with the family allowance scheme in August. Free school meals, however, will be introduced only when there are canteens to provide them—a consummation still remote. Not only do we lack accommodation, but skilled kitchen-workers are scarce, and the wholehearted coöperation of teachers cannot be expected while supervision of school meals means another task for people who are already doing too much. Better feeding of children thus turns on better staffing of schools. Yet it is encouraging to realise that nearly a third of elementary-school children, and just over half of those attending secondary schools, were getting school meals by June, 1944. Before the war only 3% of elementary-school children were taking them.

Chambers and Cockburn note many other lacunæ in our services—lack of beds for confinement, poor safeguards for the child who is sent to a foster home, inadequate inspection of homes and orphanages, too little inquiry into the fitness of would-be adopters of children, scanty welfare provision for the child between 2 and 5, no continuity of medical treatment for the school child, poor arrangements for children's holidays, lack of hostels for children with behaviour problems, mismanagement of delinquents, lack of psychological treatment in approved schools, too few play centres and other facilities for recreation, and poor safeguards for children working in shops and offices.

The chief need, in P.E.P.'s view, is to bring the various parties responsible for the child—the welfare clinic, the school health service, the family doctor—into a team, so that though a child may not be entirely in the care of one doctor, yet he will receive continuous care by a group of colleagues, rather than patchwork attention from various people who may not all be on the best of terms. The health centre, they suggest, is the place where the local-authority medical officers and the family doctor will be able to work together, sharing the services of the health visitor, and using a common system of records. In this way the centre would become the local focus for health supervision of young children and, working with the hospitals, for treatment of sick children of all ages. School and nursery school will be the place for medical supervision of children from the age of 2 onwards, and the children's unit or children's hospital, relieved of much minor medical work, will be a consultant and specialist centre, besides providing beds for those who need them. The maternity hospital will have an infants' department and premature-baby unit, and the special hospitals will cater for various types of maladjusted, defective, or invalid children. If these services work together, as P.E.P. picture them doing, it will be possible to keep complete and continuous records for each child, which will provide the data on which development of child-health services can be based.

MYASTHENIA GRAVIS AND THE THYMUS

THE operation of removing the thymus to relieve the symptoms of myasthenia gravis was introduced in the United States in 1941.[1] The first extensive series was reported a year later in this country by Keynes and Carson [2]; of 12 patients submitted to operation, 3 died and 7 were completely, or almost completely, relieved of symptoms. The hope expressed at that time—that this surgical experiment was the beginning of a real advance—has now been largely fulfilled, as is evident from the report, on another page, of a recent meeting of the Royal Society of Medicine. In the series described the decline of mortality associated with operation may

1. *The Unification of Pharmacopœias.* Interim Report of the Technical Commission of Pharmacopœial Experts. (*Bull. Hlth Org. L.o.N.* 1945–46, 12, extract 4.)
2. The Nation's Children. British Association for Labour Legislation, 21 Clareville Grove, London, S.W.7. Pp. 39. 9d.
3. Planning. April 18, 1946, no. 248.

1. Blalock, A., Harvey, A. M., Ford, F. R., Lilienthal, J. L. jun. *J. Amer. med. Ass.* 1941, 117, 1529.
2. See *Lancet*, 1942, ii, 673.

be attributed to further experience in managing the stormy postoperative period and to the skill of Keynes, though he modestly described himself as a carpenter carrying out the physicians' directions. Dr. Purdon Martin made it clear that the operation can be received with only qualified approval. But it is equally evident that until the biochemical changes in myasthenia gravis can be controlled by other methods it will continue to help sufferers otherwise doomed to a miserable lingering existence and a probable early death.

NEW TOWNS FOR OLD SLUMS

"In all the great new towns of the Midlands and the Industrial North large housing estates sprang up on which, by the exercise of remarkable forethought and ingenuity, so great was the anxiety lest the worker should be too far removed from the sights and sounds of the factory or mine which was the scene of his cheerful labour, a quite fantastic number of working families were accommodated. In order that the inhabitants might have the privilege of contemplating, almost ceaselessly, the visible tokens of nineteenth century man's final triumph over nature, many of these estates were carefully built alongside the permanent way, or even, if there was a viaduct handy, actually underneath it. . . . These working-class residential districts met with the complete approbation of landlords and employers alike and it was only at the very end of the century that the voices of certain muddle-headed philanthropists were heard declaring that such houses and streets were unfit for human habitation. The best answer to such officious and inexperienced busybodies is provided by the fact that today, after a lapse of nearly a century, a large proportion of the population still live in them."[1]

THE New Towns Bill is an earnest of the nation's wish to empty those black estates and build more honourably. But in dispersing the inhabitants we must distribute their homes round appropriate centres of employment, and avoid the further growth of the straggling suburbs which in the last thirty years have depressed the spirits of all but their builders. The Minister of Town and Country Planning has based his Bill on the two interim reports of the Reith Committee,[2] and has followed all their main recommendations. The development of the new towns is to be placed in the hands of public corporations, appointed by the Minister, one for each town. If the Minister, after consulting the local authorities concerned, decides that an area should be developed as a town he may make an order dedicating that land to the purpose. The area may include an existing small town which will form a nucleus. The corporation will have powers of compulsory purchase to acquire the site; but where land belongs to a local authority or to the National Trust special Parliamentary procedure will be necessary before the corporation can acquire the land. Outlay will be met by the Government through a consolidated fund, and the corporations will not have power to borrow money otherwise than through the Exchequer. Each new town is to be built as quickly as possible to receive a population of 15,000–20,000; and after that it may be developed up to but not beyond its intended limit, and the area must be large enough to allow for a green belt.

Each corporation will consist of a chairman, a deputy chairman, and up to seven other members, appointed by the Minister after consultation with the local authorities concerned; and its establishment will not affect the powers and duties of the local authorities. When the work of development is complete, some 10 or 12 years after the end of the war, the corporation will hand over to the local authority. This uniform type of corporation was criticised at the second reading of the Bill. The parliamentary reception of the Bill was otherwise largely favourable, reflecting the public determination to have done with delays in this important work. The *Times* of May 9 reminds Mr. Silkin that he cannot get very far in replanning town life without strengthening the Distribution of Industry Act. This was a point which the Reith Committee had in mind; they do not think it will be possible to synchronise perfectly the movement of employing firms with the movement of employed people; and so for a time the new towns may be simply dormitory towns. The corporation in that case must ensure proper transport for the workers to their work. But, as the committee point out, "a semi-dormitory which becomes self-contained is better than a suburb which is a dormitory for all time."

1. Osbert Lancaster in *Pillar to Post*.
2. Interim Report and Second Interim Report of the New Towns Committee. H.M. Stationery Office. 4*d*. and 6*d*. respectively.

THE INSOMNIA OF HEART FAILURE

THE therapeutic value of a good night's sleep is nowhere more evident that in patients with heart failure; yet these people are often peculiarly resistant to soporific drugs. Wheeler and White[1] suggest a possible reason for this. In their view insomnia may be the presenting symptom of left ventricular failure, and in patients with hypertension, aortic stenosis, aortic incompetence, and extensive myocardial infarction the cause of the insomnia may be pulmonary congestion, even though no basal crepitations are present. Inquiry usually reveals that these patients have dyspnœa on exertion and that though they do not complain of nocturnal dyspnœa, they are more comfortable sitting up than lying down. Even in cases where the diagnosis of left ventricular failure is obvious, it is not always realised that the sleeplessness is due to this orthopnœa, and vain attempts are made to control it with hypnotics. Ultimately sleep may improve because of the onset of right ventricular failure which temporarily relieves the pulmonary congestion, but by this time the patient is likely to be beyond the reach of any form of treatment. On the other hand, if the cause of the insomnia is appreciated in the early stages there is a good prospect of bringing relief to the failing myocardium by rest and the administration of digitalis, or, if the condition has progressed too far to respond to these measures, by a course of organic mercurial diuretics with a low-salt diet. Moreover, by reducing the pulmonary congestion, this treatment will relieve the insomnia.

MEDICAL FILMS

VOLUNTARY coördination in the production of medical films is proposed by the medical committee of the Scientific Film Association. An intending producer may obtain from the hon. secretary a list of films on the subject in which he is interested, and, if possible, a viewing will be arranged. It is suggested that producers should confidentially inform the hon. secretary of subjects that are to be filmed, to avoid overlapping by the simultaneous production of more than one film study on a single subject. Offers of coöperation should be sent to the committee's hon. secretary, c/o the Royal Society of Medicine, 1, Wimpole Street, London, W.1. The committee has now published its fourth hand-list of medical films, most of which have been issued within the last twelve months.

Surgeon Rear-Admiral Sir Gordon Gordon-Taylor has left for America, where he is to occupy the chair of surgery at Harvard University for a complimentary period at the invitation of the professor, General Elliot Cutler.

AMONG those elected on May 9 to the foreign membership of the Royal Society was Dr. Herbert Spencer Gasser, director of the Rockefeller Institute for Medical Research in New York.

1. Wheeler, E. O., White, P. D. *J. Amer. med. Ass.* 1945, 129, 1158.

Reconstruction

REMUNERATION OF THE GENERAL PRACTITIONER *

IN February last year a committee was appointed to consider what ought to be the range of total professional income of general practitioners in any publicly organised service. The chairman was Sir Will Spens (formerly vice-chancellor of Cambridge University); the eight other members included Dr. J. A. Brown (chairman of the Panel Conference), Dr. O. C. Carter (Bournemouth), Dr. W. M. Knox (Glasgow), and Dr. S. A. Winstanley (Urmston, Lancs); and Dr. Violet Kelynack (B.M.A.) was one of the secretaries.

The committee was asked to pay due regard to what have been the normal financial expectations of general medical practice in the past, and its information on this subject is drawn from a report (prepared for the British Medical Association by Prof. A. Bradford Hill, D.SC.) on the incomes of practitioners in 1936, 1937, and 1938. This information was obtained by analysing the answers sent by 3008 doctors in response to a questionary addressed to a random sample of 4888, and, as Professor Bradford Hill points out, the final sample may not be representative of all those approached; but the committee thinks that it is "sufficiently accurate for our purpose," being unlikely to involve more than a 10% error in the mean incomes revealed.

Table A shows the distribution of net incomes of practitioners of various age-groups in urban areas in 1936–38. (The net income is the sum left after deducting the professional expenses allowed for purposes of income-tax.)

TABLE A—NET INCOMES IN URBAN AREAS, 1936–38

Ages ..	30–34	35–39	40–49	50–54	55–59	60–64
	%	%	%	%	%	%
Under £700 p.a.	22·0	16·5	20·0	17·5	30·0	33·5
£700–£1000 ..	35·0	25·0	22·5	23·5	22·0	26·5
£1000–£1300 ..	23·0	23·0	21·0	22·0	19·0	15·5
£1300–£1600 ..	10·0	20·0	17·5	15·0	12·5	15·0
£1600–£2000 ..	7·0	10·0	10·0	10·0	11·5	6·0
£2000–£2500 ..	2·0	4·0	5·5	7·5	2·5	3·5
Over £2500 ..	1·0	1·5	3·5	4·5	2·5	—

It will be seen that between the ages of 40 and 55—i.e., throughout the best years of a general practitioner's working life—almost 20% of urban practitioners had a net income below £700 a year, and over 40% had a net income below £1000.

"Having regard to length of training, to the arduousness of the general practitioner's life compared with that in other professions, to the greater danger to health, to the skill and other qualities required and to the degree of individual responsibility, we are unanimous in holding that the percentages of low incomes are too high. Having regard to the same facts, we are clear also that the proportion of practitioners able to reach a net income of £1300 or over is too low. We consider that unless conditions are substantially improved in both these respects, and on the basis of a pre-war value of money, the social and economic status and the recruitment of general medical practice could not, in the long run, be maintained.

"We believe that this would be so even apart from proposals for a publicly organised general medical service. There is, however, one particular factor involved in comprehensive proposals for such a service which is calculated to have very grave repercussions on recruitment to general practice unless the financial expectations in that field of practice are improved. In the past, many young doctors have been deterred from becoming specialists by the considerable risks and by the practical certainty of a number of lean years if they attempted to do so. In a comprehensive public service it is inevitable and right that the risks and lean years will present a less formidable deterrent. A much increased menace to the recruitment of general practitioners in the future will lie, in our judgment, in the competition of other branches of medicine than general practice. We, and not least our lay members, consider that it would be disastrous to the profession and to the public if general practice were recruited only from the less able young doctors. We consider, however, that unless the financial expectations in general practice are substantially improved the great majority of the abler men will seek to become specialists, in view of the fact that as specialists they have an equal outlet for their interests in medicine, can more easily keep close contact with hospitals and with medical progress and will have a less arduous life.

"There is a further factor to which we attach considerable importance. The help, support and comfort which a doctor can give to his patients must, in our judgment, be seriously affected if a doctor is himself seriously worried. We have no doubt that low incomes have, in fact, been a source of grave worry to many general practitioners and must have prejudiced their efficiency."

WHAT IMPROVEMENT IS DESIRABLE?

The committee did not think itself qualified to say what adjustment of pre-war incomes is necessary to produce corresponding incomes today. Its recommendations therefore are entirely in terms of pre-war money. The report is to be read as if it were produced in 1939, and the committee leaves to others the task of translating its 1939 figures into their present equivalent.

After long discussion it decided in favour of securing an alteration in the spread of incomes not less favourable than is shown in table B.

TABLE B—DISTRIBUTION OF NET INCOMES IN AGE-GROUP 40–49

	Proposed Distribution (%)	*Distribution before 1939* (%)
Under £700	7	20
£700–£1000	20	22·5
£1000–£1300	24	21
£1300–£1600	24	17·5
£1600–£2000	16	10
Over £2000	9	9

"The effect of this proposed distribution is, as will be seen, to reduce from 20% to 7% the proportion of incomes under £700; to reduce from 42·5% to 27% the proportion of incomes under £1000; and to increase from 36·5% to 49% the proportion of incomes over £1300. We do not think it necessary to recommend an increase in the proportion of incomes of or over £2000 but we consider that this proportion ought to be maintained and that it should be possible for practitioners of exceptional skill and ability to reach a net income of at least £2500.

"The effect of our proposals can be put very simply by saying that between 40 and 50 years of age approximately three-quarters of general practitioners ought to have achieved a net income of over £1000 per annum, approximately half ought to have achieved a net income of over £1300 per annum, approximately a quarter ought to have achieved a net income of over £1600 per annum and slightly less than 10% a net income of £2000 or over."

The committee next considered what ought to be the position in regard to lower and higher age ranges, and concluded that in the age-groups both above and below 40–49 ("even between 30 and 35") doctors ought to receive substantially the same remuneration for the same burden of practice.

"It appeared to us undesirable that men should be less well remunerated merely on grounds of age, save perhaps to a very limited extent, when they were carrying the same responsibilities and feeling the same discomforts of full and heavy practices. Further, a good chance of achieving success, and of receiving a corresponding

* Report of the Interdepartmental Committee on Remuneration of General Practitioners. Cmd. 6810. H.M. Stationery Office. Pp. 31. 6d.

income, at an early age is likely to weigh heavily in favour of general as against specialist practice, and thus to provide a balance . . . to the attractions of the latter."

The committee then tried to ascertain how much the incomes of practitioners in 1939 would have had to be augmented in order to secure the kind of distribution it thought desirable. Seeking a formula, it found that if all incomes under £1200 had been augmented by £200, and all incomes of £1200–2000 by a quarter of the difference between that particular income and £2000, the distribution would have been as shown in table C. It will be noted that for age-groups 40–49 this agrees roughly with the distribution proposed in table B.

TABLE C—DISTRIBUTION OF INCOMES IF 1939 INCOMES HAD BEEN AUGMENTED ACCORDING TO THE COMMITTEE'S FORMULA

Ages ..	30–34	35–39	40–49	50–54	55–59	60–64
	%	%	%	%	%	%
Under £700 p.a.	10·5	6·6	8·0	7·2	20·4	17·4
£700–£1000 ..	22·3	16·6	19·1	17·3	15·8	23·2
£1000–£1300 ..	35·0	26·6	23·4	24·8	21·9	27·5
£1300–£1600 ..	17·8	26·9	23·7	23·7	21·5	17·9
£1600–£2000 ..	11·6	17·7	16·7	14·9	15·4	10·6
Over £2000 ..	2·7	5·6	9·1	12·0	5·0	3·4

WHAT MIGHT BE DONE

The committee's next task was to consider how far and in what circumstances such a spread of incomes as it had in mind could be realised. While explaining that it is directly concerned only with the remuneration a practitioner should receive and not with the method or basis of his payment, it points out that the two problems cannot be entirely separated.

"We are satisfied that there is a far greater diversity of ability and effort among general practitioners than admits of remuneration by some single scale applicable to all. If the recruitment and status of the profession are to be maintained men must be able to feel that more than ordinary ability and effort receive an adequate reward. On the other hand, a reward which would be appropriate when these exist would be extravagant when they do not. In consequence, we are clear that any satisfactory system of remuneration must involve differentiation dependent on ability and effort. Further, if the profession is to be satisfied and recruitment maintained, it is essential that the method of differentiation should command confidence. We are satisfied by the evidence put before us that no existing degree or qualification can wisely be made the basis of additional payment, largely because many of the qualities which make the best general practitioner are, in fact, unexaminable."

The committee expresses no opinion on the question whether a practitioner should be paid wholly or partly by capitation fees or by a method which takes capitation fees into account. It received evidence that payment by capitation is acceptable to a majority of the profession; but "other methods . . . may prove acceptable or may be preferred for other reasons," and "while we assume in the discussion which follows that incomes are dependent at least to a substantial extent on the number of patients for whom a practitioner is responsible, we do so merely because this is a possible method, and the most obvious method, of securing such variations of income as are necessary if different degrees of ability, effort and resulting work are to be suitably remunerated."

How then could the committee's proposals for a better distribution of incomes be realised if the practitioner were paid largely in capitation fees? If the great majority of doctors had each a number of patients not far from the average, there would obviously be no such differentiation of incomes as is shown in tables B and C: while it would be easy for example to arrange that 50% had less than £1300 a year and 50% had more, it would be harder to ensure simultaneously that only about 25% had less than £1000, about 25% more than £1600, and nearly 10% over £2000.

"Difficulty is most likely to arise over the highest and lowest income ranges. So far as the latter are concerned the difficulty could be met if practitioners received or could qualify for some augmentation of income which was independent of capitation. We anticipate that the general introduction of a publicly organised service would of itself level up low incomes to a considerable extent. In consequence any augmentation required would be likely to be small, and such as might be provided, for example, if sufficient refresher courses could be made available by paying a bonus of, say, £100 a year to a practitioner who had attended such a course within the preceding three years, or even by making a grant towards professional expenses when, as is the case with the lowest incomes, they represent an abnormally high percentage of gross receipts. We stress this point so as to make clear that the question whether a substantial part of a practitioner's income should take the form of a fixed salary or retaining fee is not involved and remains to be decided on general ground of policy.

"Where we expect most difficulty to arise is in regard to securing the percentage which we think desirable of practitioners with net incomes over £2000 and the possibility of incomes of not less than, say, £2500. As has been said we do not think it necessary in order to maintain the recruitment and status of general practice that the percentage of incomes over £2000 should be increased, but we think that it is certainly necessary that this percentage should be maintained and, also, that there should continue to be a real possibility of obtaining in a small proportion of cases incomes considerably over £2000. The difficulty is likely to arise owing to the fact that no practitioner can assume responsibility for more than a certain number of patients and because this number may well not be sufficiently large to provide high incomes in the absence of a considerable amount of private practice."

To get over this obstacle the committee proposes that any practitioner should be free to engage an assistant, and that some 10% of them, selected on grounds of success in practice and general suitability, should be encouraged to do so.

"We suggest in the first place that such a practitioner should receive as part of his remuneration in a publicly organised service a supervision fee of £100 per annum in respect of an assistant who had no previous experience or only one year's previous experience of general practice. We suggest that such an assistant should receive £500 in his first year, and £600 in a second year if any. Since these salaries and additional professional expenses, say, £250, will have to be met by the principal and since it would take time to enlarge a practice to the extent which would cover this expenditure, we suggest that a practitioner who has been approved for this purpose *and who has not previously had an assistant* should receive, in addition to the £100 supervision fee, say, £500 in the first year, £300 in the second year and £100 in the third year in which he had assistants of the type in question. We believe that some such system would improve training, would enable the most successful practitioners to treat or supervise the treatment of considerably more patients, thus making their services more widely available, and would meet the difficulty we anticipate in securing that incomes substantially over £2000 will continue to be obtainable in general practice."

The committee recommends that after completing house-appointments the doctor wishing to enter general practice should spend a year, or preferably two years, as an assistant, receiving a net salary of not less than £500. It has little doubt that even those intending to become specialists would benefit by spending a year in this way.

Though it feels that a single salary scale, applicable to all, would be inappropriate for general practice, it points to the advantage, "even in a profession which in an

unusually high degree is also a vocation," of enabling the potential entrant to gauge his financial prospects. Short of a salary scale, he would be helped by knowing that certain specified percentages of practitioners reach between, say, 40 and 50 years of age, certain levels of income.

RURAL AREAS AND HEALTH RESORTS

Mixed practices have produced somewhat higher incomes than urban ones, but it is doubtful whether this difference would persist in a publicly organised service. More serious is the difference between average remuneration in urban and rural practice.

"... we consider that the differences of approximately £200 which existed in 1939 between incomes about the £1000 level in the two classes is excessive and requires reduction by about half, when regard is had to all the facts involved. It appears probable that this could best be secured by weighting mileage more heavily.

"We wish to add that we are convinced that it will be necessary to extend to certain other sparsely populated areas the system adopted in the Highlands and Islands Scheme and we cannot regard as adequate even in 1939 the remuneration under that scheme. We consider also, not only or even particularly in regard to rural areas, that it may be necessary to supplement incomes in respect of areas which are so unattractive as not to draw to them an adequate supply of doctors."

For health resorts in which old persons and invalids tend to congregate some special provision will be desirable, either by a general weighting of capitation fees in the case of the aged and chronic sick, or by a contribution from a central to a local pool.

THE COST

Assuming that the number of people covered by the service is 45 million, the committee believes that its proposals could be realised at a cost of 15*s.* 6*d.* a head, of which 6*d.* would cover special expenditure and 15*s.* the normal remuneration of practitioners. As its figures represent a "very considerable increase both on capitation payments under the existing National Health Insurance Scheme and on the total net income of practitioners in the three years ending in 1939," the committee explains its reasons for recommending this increase. The first is that the N.H.I. capitation payments appear to have been inadequate. Secondly, even apart from the introduction of a publicly organised service, "we do not believe that a profession involving the arduous life and heavy responsibilities of general practice could permanently maintain its recruitment in present conditions, either as against other professions or as against other branches of the medical profession, with so high a proportion of low incomes in middle age as the payments before 1939 in fact produced." Thirdly, through the introduction of a new service "doctors will have to do yet more work," and general practice must be made attractive enough to prevent all the abler men trying to become specialists. "General practice is the foundation on which all else is built. If its recruitment is not maintained—alike in quantity and quality—both as against other professions and as against other branches of the medical profession, no other health service, specialist or hospital service, however excellent, can make good the loss or even play successfully the part it should play."

RECOMMENDATIONS

It should be noted that the following recommendations by the committee are expressed in terms of the 1939 value of money:

(1) A scheme should be devised which will ensure that between 40 and 50 years of age approximately 50% of general practitioners receive net incomes of £1300 or over, and which will also secure, so far as practicable, that between 40 and 50 years of age approximately three-quarters receive net incomes over £1000, that approximately one-quarter receive net incomes over £1600, that slightly less than 10% receive net incomes over £2000, and that, in a small proportion of cases, it is possible to obtain net incomes of at least £2500. (This proposal is approximately equivalent to the augmentation of net incomes in 1939 by £200 in the case of incomes between £400 and £1200 and, in the case of incomes over £1200, by £200 at £1200, diminishing progressively to nothing at £2000.)

(2) Before 40 and after 50, practitioners should be remunerated at the rate applicable between 40 and 50 to the burden and responsibilities of practice which they are in fact carrying.

(3) In securing the above results, a method of differentiation of income should be chosen which will command so far as possible the confidence of the profession.

(4) The difference which has existed between the incomes of rural and urban practitioners should be reduced; the Highlands and Islands Scheme should be applied to other sparsely populated areas, and the remuneration under that scheme should be increased.

(5) Additional remuneration should be given in areas which prove so unattractive as not to draw an adequate supply of practitioners.

(6) An adjustment in the method of payment in so far as this depends on capitation should be made in the case of practices involving an altogether abnormal number of aged persons and chronic invalids.

(7) On completion of resident hospital appointments a recently qualified practitioner should secure an initial net income of not less than £500 per annum as an assistant to a doctor in general practice.

RIDER TO THE REPORT

The committee's report is signed by all the members except Sir Ernest Fass, formerly a Public Trustee, who dissociates himself from recommendations 1 and 2. In a rider he points out that the range of remuneration must be such as will attract to, and retain in, the National Health Service a sufficient number of men and women of the capacity required for its work; but "there is no evidence that the financial reward played any large part in the choice of medicine as a career, or that the financial prospects which are disclosed in Professor Bradford Hill's tables were a deterrent to entry into the profession in the pre-war years. There was in those years no decline in the number of entrants to the schools, though five out of twenty-three Deans report a falling off in quality."

Among the factors that should be taken into account in settling a scale of remuneration for general practitioners is "the financial return in other comparable professions, a matter which is not discussed in the report. ... I see in the establishment of a publicly organised general practitioner service no cause for varying the relativities either between the professions or within the medical profession itself." He suggests a comparison between the position of a general practitioner and that of a doctor employed whole-time in a local-authority hospital, and the range of remuneration which he recommends is based partly on the scales adopted last

TABLE D—SIR ERNEST FASS'S PROPOSALS FOR DISTRIBUTION OF INCOME

	1946 (%)	*1939* (%)
£500 at entry rising to £700 after 3 years and then to £1200 ..	50·0 ..	64·15
*£1200–£1800	30·0 ..	26·09
*£1800–£2200	12·5 ..	5·69
£2200–£2500	5·0 ..	2·00
£2500–£3000	2·5 ..	2·07

* These are the Middlesex county hospital scales for "senior clinicians" and "senior clinicians on proof of outstanding achievement" respectively.

November for Middlesex county hospitals. His recommendations (table D) are for net earnings and (unlike the figures in the report) for 1946. The 1939 percentages are taken from Professor Bradford Hill's tables and are for all ages.

Sir Ernest concludes by saying that "there should be opportunity for every doctor to reach £1200 by the age of 40 and nothing to prevent him reaching the higher ranges before that age."

Special Articles

ROYAL COLLEGE OF SURGEONS

NATIONAL HEALTH SERVICE

AT a meeting of fellows on May 8, Sir ALFRED WEBB-JOHNSON, the president, reported resolutions by the council of the college on the National Health Service Bill. The council, he said, concurs with the observations of the Negotiating Committee on the proposed service and gives the committee its full support. It also makes the following observations:

(*a*) The Negotiating Committee is urged to press for the direct and independent representation of the medical profession on whatever statutory bodies may be set up to administer the service.

(*b*) The council reaffirms its opinion (recorded on Feb. 27) that "State ownership of the hospitals is in no way essential to the successful administration of a National Health Service."

(*c*) While approving of the principle of unified control of hospitals other than teaching hospitals by regional boards of satisfactory composition, the council views with apprehension the appropriation of trust funds.

(*d*) The council does not agree that the power to retain existing endowments and accept funds should be confined to teaching hospitals.

(*e*) The institution of health centres should be experimental in the first instance.

(*f*) The council is opposed to the principle of a whole-time salaried service.

(*g*) The council agrees with the Negotiating Committee that "control" is unnecessary and undesirable in regard to the distribution of doctors. An adequate distribution can be effected without any change of system other than the offering of extra inducements in the case of unattractive districts.

(*h*) The present system of sale and purchase of the goodwill of general practices should not be interfered with; but if the sale of practices is made illegal or otherwise rendered ineffective, adequate compensation should be paid.

(*i*) The restrictions which it is proposed to place on the provision and use of private accommodation in hospitals are considered undesirable. Hospital services should be so planned as to provide for all classes of the community, and no regulations should be introduced which would discourage private patients from going to hospital for treatment, or discourage specialists from advising them to do so. In general, the fees payable by private patients should be fixed by the medical profession without interference by outside authorities, except that, when accommodation is provided at specially reduced rates for persons of moderate means, it is reasonable to lay down a maximum charge for professional services.

The PRESIDENT said that the whole scheme should be considered on its merits, and not as a political issue. The profession's task now was to obtain such amendments as were considered necessary.

Mr. T. B. LAYTON suggested that there had been too much opposition to the Bill as a whole; many of its terms had been foreseen for the last 30 years. Although some clauses might be disputed, two of the proposed reforms were undoubtedly timely: these were the withdrawal of domiciliary treatment from approved societies and the removal of hospitals from the local political system. Some of the issues on which the profession was criticising the Bill should, he considered, be debated and decided after the Bill was enacted: most of the points were not suitable for inclusion in an Act, where they would have a degree of permanence which would hamper subsequent amendment. It was wrong, he thought, to insist on the right to buy and sell practices; this custom was not seemly in the public's eyes, and in recent years displeasing aspects had developed, which would eventually have compelled the profession to take action.

The PRESIDENT agreed that the Bill was bold and statesmanlike; in particular, the institution of regional bodies which are to have full authority would be an important advance. But there were many points for adjustment.

Mr. WILFRID ADAMS suggested that national health should be safeguarded by a medical advisory committee. Is this Bill, he asked, emanating from leaders of the profession? He considered that the operation of the National Health Insurance Act and of the tuberculosis service indicated the Government's incapacity to organise the medical service; and he suggested that the profession should offer an alternative plan to that advanced in the Bill. The present Bill should be an interim measure; and the Government should be guided by the profession in deciding the form of the more revolutionary changes, the introduction of which should be deferred.

Mr. DICKSON WRIGHT defended the sale and purchase of practices, which, he said, was a guarantee of good faith by doctors. The effect of the Bill, he said, would be to foster not only utility hospitals but also utility doctors.

A motion by Mr. LAYTON that the council's resolutions and its action in supporting the Negotiating Committee should be approved was carried unanimously.

Medicine and the Law

Reinstatement

A MEDICAL officer was appointed to the staff of Whipps Cross Hospital in 1932, and in 1939 was drawing his maximum salary of £450 per annum. On August 31, 1939, he resigned to join the R.A.M.C., which he did on the following day. About a month before he was demobilised he wrote to the hospital concerning his return but he did not fill in a reinstatement form. He was informed that there was a vacancy for a temporary appointment at the hospital and on the advice of the medical superintendent he applied for and obtained this appointment which carried a salary of £350 a year. This was about a month before he was demobilised. In view of his previous service with the West Ham borough council he applied by letter for his previous salary and for his appointment to be permanent. He received the reply, however, that as he had resigned in 1939 and had withdrawn his superannuation contributions the council did not propose to take any action in the matter. He appealed against this decision and the matter was referred to the Reinstatement Committee. The committee, after hearing counsel representing the medical officer, made an order that the West Ham borough council was to make available for him employment at Whipps Cross Hospital from Sept. 1, 1945, at a salary of £450 a year, plus cost-of-living bonus, on terms not less favourable to him than those which would have been applicable to him had he not become a person to whom the Act applied.

The practitioner was assisted and represented by the London and Counties Medical Protection Society.

Sir Howard Florey, F.R.S., is visiting Paris and Lyons under the auspices of the British Council from May 18 to 25. He is to receive an honorary degree at Lyons, where he will lecture on penicillin and allied subjects.

In England Now

A Running Commentary by Peripatetic Correspondents

"*Frozen!*" Was it unconscious irony when officialdom first coined this phrase? How apt it is—but one wonders whether they realise the cold, numb, frustrated despair which grips a man when he hears he is not to be released in his age and service group. Near madness clouds the mind: for five years and more one has been buoyed up with dreams of leaving it all behind; of rejoining one's wife and home. The calculated date stands ringed before one and crawls nearer hour by hour. There are but a few short days to go. Already preparations are under way at home—perhaps a celebration party of old friends, a job fixed up, appointments made—then, and not till then, cold icy officialdom strikes to "freeze."

The date that was ringed for joy now stares in empty mockery from a meaningless calendar. One wonders how to tell a wife without too great a hurt. One sees a long-worked-for job going to a rival of student days; the holiday of holidays planned and booked now cancelled—no wonder one is frozen, benumbed in mind and soul. Is this the brave new world where all is fair? Is this the reward for working to get "That little extra some others haven't got"?

Wild schemes of rebellion jostle through one's head, till finally one falls into an uneasy paranoic sleep, half glimpsing pre-views of the soulless bureaucratic Bevan-world to come.

* * *

We were very grateful for the steaming coffee which appeared in tin picnic cups on a tin tray, together with white rectangular sugar-lumps the like of which we hadn't seen since last in Cairo. And the coffee tasted good—unusual in local establishments. For more than an hour we had been sitting in the hall space at the end of a short corridor, between the street and the house proper. In addition to the through-and-through draught we were also subjected to a still more piercing down-draught from the bomb-damaged roof. Even in the half light our pale faces were clearly reflected in the glass-fronted show-cases on the opposite wall. The old lady who sat behind the counter was wiser. She was perhaps better acclimatised than we, but she wore a heavy winter coat, while we had removed our Burberrys and our hats on arrival, so warm were we after a brisk step which in the last stretch had tried our wind.

It was of the nature of a social visit—or so we imagined by now. We had introduced ourselves as serving with a captain whose name recalled girlhood memories. "Do I know him, Ser? I remember him as a lieutenant, and his father before him!" And she lapsed into reminiscences dating from the sunny days of Edwardian peace, names of commanders-in-Chief (Mediterranean) falling from her lips like so many "Hail Marys." As she leant back from a position of confidential whisper, the smoke from her cigarette framed poster-portraits of members of the senior service to whom we were introduced in turn. Truly we were with the great! And she herself is a great lady, known to three generations of fighting men by her christian name—Carmela. Years have dealt kindly with her. Her hair is silver, her health robust and apparently unaffected by the shortage of siege and the bombing. But from one eye her sight is forfeit. "I prayed, Ser. I prayed for four hours each day, and God spared us." "Yes, Mother." Her son and some grandchildren had joined us.

We scarcely dared to mention the purpose of our visit; but her son had just brought in some new "pieces." "These are verra fine, Ser." And we were at once privileged—Private View! Members' Day! Wrinkled fingers smoothed each piece against the black velvet with suitable descriptive incantation, and revealed in each a characteristic beauty. A few were fine, like spider's web against some dark pool, transformed to silver in the light of morning sun; others showed like daisy-heads on summer's lawn, or again as frost-patterns on winter's pane. We ignored the larger net-like varieties with emblem-cross emblazoned and those which in one word declared their origin. Carefully we chose the dainty and the pleasing, for our Christmas, or birthday, or home-coming presents.

But could we really offer to purchase? We were paying a call. Fine points of the art had been explained—indeed, we had seen uncovered, but a few minutes before, the very technique of the fabrication; the pinned-pattern, part-wrought, with all its peculiar pendant "pirns." Yet, still we felt that these objets d'art could scarcely be translated into pounds, shillings, and pence—or rather pounds and shillings, for war-time values here are such that only paper-money is seen. Reassurance came from the recollection of a remark by a lady-artist that while "acceptance" of her water-colours gave her satisfaction, the attached white labels bearing four red letters were what afforded true delight. Thus emboldened, we put together our selection, gently, one by one. . . . Quick hands almost seized our choice; an appraising eye searched the pattern. . . . "Yes, Ser, that iss good, verra good! Registered, Ser? I post them registered today? No? You take them! Verra fine work, Ser. What I say, just my war-time work, but verra best, Ser!"

We shall treasure those Maltese lace collars and hand-kerchiefs dearly.

* * *

A soft answer may turn away wrath; and so may an explanatory one. On a beautiful sunny afternoon I was at Lord's sitting behind a man with black hair, when I noticed that he had two symmetrical patches of grey hair where the great occipital nerves become cutaneous. At the end of the game I asked the man bluntly if I could have a photograph of the back of his head. After looking at me in blank astonishment he told me to go to the devil. Whereupon I told him I expected some such an answer and elaborated my scientific reasons for my question. After being assured that the grey patches were not indicative of dangerous bodily complications and that if I could give complete physiological and pathological reasons for their presence I would be F.R.S. tomorrow, he became a mollified accomplice and promised me a photograph if I paid the expenses. Eventually I got the photograph and paid the bill, but the photograph was blown to smithereens in a blitz. I would like to possess another photograph to see if any changes in pigmentation have occurred after all these years.

* * *

I am rather addicted to news-films—that is, I revel in the short coloured Disneys and Disneyoids which pass under that name—and since there is a news cinema half-way between the Royal Society of Medicine and the hospital where I do my outpatients I often indulge this taste. I am also rather an amateur of psycho-analysis, and it has gradually been borne in on me that these films exhibit phenomena which are of some analytical interest. Thus they are almost without exception about animals; this means that there need be no restrictions in portraying behaviour and motives, and the animal is a well-known symbol for the unconscious. Further, they have to be turned out with such frequency and regularity that the process of composition must have become by now one of pretty free association. So perhaps it is not surprising that they should recurrently portray some very basic features of the human mind.

Two points particularly occur to me. One is the common situation where Pluto is trying to rid himself of a fly-paper by frenzied efforts which only result in attaching it to another part of his anatomy, or Mickey is having similar troubles with a coiled spring or a mouse-trap. The other is where, having escaped (as he thinks) after a furious chase from some enormous pursuer such as a bear, the hero-animal finds himself sitting down unawares in the creature's lap or backing into him.

I leave all this to the professionals to interpret; they would find it an interesting field for research. But it does seem to be related to questions of compulsive and obsessive behaviour, such as the unsuccessful attempts we all make to lose unpleasant traits which are after all part of ourselves, and the unhappy regularity with which our more primitive emotional drives catch up with us and make nonsense of our higher aims.

* * *

When in one of his recent "Good Health" talks the Radio Doctor was extolling the value of fish as food, at one stage his professional interests overcame his gastronomic, so that caviar was distinctly described as the "roe of the surgeon." Would this be "chirurgiophagy"?

Parliament

ON THE FLOOR OF THE HOUSE

LAST week Monday's sitting of the House ended at 12.24 A.M. on Tuesday, and Tuesday's sitting at 5.23 A.M. on Wednesday morning. This chapter of late sittings seems likely to be the rule rather than the exception and means that members will be as much judged by their physical powers of endurance as by their political knowledge and parliamentary skill.

The House meets now at 2.30 P.M. on the ordinary routine, and on the morning after these late sittings some members had to be present at Standing Committees at which the work of detailed discussion and amendment proceed.

This is serious enough in itself; but it may fall to the House to have to consider matters of great significance and vast importance when in this condition of fatigue, as happened last Tuesday and Wednesday afternoons, when the proposed evacuation of British troops from Egypt was announced. But we have not heard the last word of the Egyptian question, and of its related questions of Middle and Near East policy. The clouds of war still drift over Palestine and Greece and the Balkans, and rumours of war come out of Eastern Europe. The world is very unstable and the threat of world famine does not recede.

Talk in the lobbies of the House is that the margin of food safety in Europe is one of weeks, not months. So that Mr. Herbert Morrison's visit to President Truman has special significance. It is one more attempt to lift the consideration of these fundamental political and economic matters out of the fog of national politics and national prejudices into the UNO world of instructed understanding.

MEDICUS, M.P.

FROM THE PRESS GALLERY

New Towns for Old

In moving the second reading of the New Towns Bill in the House of Commons on May 8, Mr. L. SILKIN, Minister of Town and Country Planning, recalled that it was Sir Thomas More who first deplored the suburban sprawl, and in his *Utopia* there were 54 new towns each 23 miles apart, and each divided into four neighbourhoods with local centre and community feeding-centre. Sir Thomas More, he admitted, had been beheaded, but that must not be regarded as a precedent for the treatment of town-planners. It was not unreasonable to expect that More's *Utopia* of 1515 should be translated into practical reality in 1946. There had been many other warnings about the ill effects of the growth of London and other large towns. Queen Elizabeth was disturbed about it, when London had a population of 120,000, and in 1580 "an Act against new building" was passed which made it an offence to erect any dwelling-house within the city of London or city of Westminster, or within three miles of the gates of those cities. The penalty was £5. The Act was quite ineffective, and soon became a dead letter, but remained on the Statute Book until 1888. By that time London had a population of some four millions. In 1898, in *Garden Cities of Tomorrow*, Sir Ebenezer Howard advocated the building of new self-contained towns surrounded by an agricultural or rural protective belt, and he was himself responsible for the creation of Letchworth in 1903, which was planned for a population of about 35,000, but which at the outbreak of the war had a population of under 18,000. He was also the founder of Welwyn Garden City, started in 1920 for an ultimate population of 50,000, but which in 1939 had a population of about 15,000.

Thus the failure to deal with suburban sprawl was not due to any lack of warnings, commissions, or reports. Between the wars some 5 million houses were built, and the effect on the countryside and our towns had been almost calamitous. Large numbers of people in the towns were living in overcrowded conditions, and housing estates built on the outskirts had largely failed to provide a better life for the people. Today there was a need for another 5 million houses, but if they were to be built on the outskirts of our towns with the same lack of planning as before, Mr. Silkin dreaded to think what this still fair land of ours would be like in 10 or 15 years. The houses now to be built must be carefully located in new self-contained communities. This applied not only to London, but almost equally to such places as Liverpool, Manchester, Glasgow, Leeds, Portsmouth, and Plymouth, each with a population ranging from 40,000 to 250,000 people for which it could not provide housing within its own boundaries. The building of new towns was the only satisfactory method of providing accommodation for the overspill population, and an effective policy for their creation must be part of our post-war replanning.

This Bill, which applied to Scotland as well as to England and Wales, provided that the Minister of Town and Country Planning would appoint a development corporation to be responsible for the building of each new town, or the substantial enlargement of an existing town. The corporation would consist of a chairman, a vice-chairman, and up to seven additional members who would be appointed by the Minister after consultation with the appropriate local authorities. They would be given the widest possible powers of estate management, but would not have any of the local-government functions of a democratically elected authority. These would remain vested in the local authority. The Bill contained machinery for the compulsory acquisition of land in the designated area. Capital moneys required for development would be provided by loans from the Consolidated Fund up to £50 million. When that had been spent it would be necessary to ask for further Parliamentary authority. It was estimated that this money would last for five years. There would be a careful check on capital expenditure, but the Minister and the Treasury must be satisfied that the expenditure was likely to produce for the corporation a reasonable annual return. The Exchequer would also pay to the corporation the appropriate housing subsidy in respect of working-class houses built by or for the corporation. It would also provide by way of subsidy the expenses of the corporation, which might amount to between £30,000 and £40,000 a year for each new town in the early years of development. It was estimated that the capital cost to public funds of the development of each new town would be about £19 million, on the assumption that most of the middle-class houses, the shops, and the factories would be built by private enterprise.

After a debate, in which one of the main points of criticism raised was that the Government ought not to restrict the agencies to a Government Corporation, the Bill was given an unopposed second reading.

National Insurance Bill

The Government have tabled an amendment to this Bill which does away with the proposal that the self-employed shall wait 24 days before receiving benefit. As a result the self-employed man's contribution will be raised from 5*s.* 9*d.* to 6*s.* 2*d.* and the woman's from 4*s.* 10*d.* to 5*s.* 1*d.* The Exchequer will contribute another 1*d.*

QUESTION TIME

Spens Report

In informing Mr. S. HASTINGS that the Report of the Spens Committee on the remuneration of general practitioners was now available, Mr. BEVAN, Minister of Health, said that he had not yet reached a decision as to the implementation of the report. He would have to have discussions with the representatives of the doctors before he reached any decision.

Unpasteurised Milk

Mr. PETER FREEMAN asked the Minister of Food whether he would see that those who desired to have unpasteurised milk should be provided with opportunities to secure it in all areas where it was being subjected to this heat treatment.—Sir BEN SMITH replied: For the present it is necessary to maintain the restrictions on the consumer's choice of milk retailer and I regret that I cannot give my hon. friend the general assurance for which he asks.

Distribution of Penicillin

Dr. R. CLITHEROW asked the Minister of Supply in view of the announced Government policy of making penicillin available on prescription to the general public as and from

June 1, what consultations he had had with the Pharmaceutical Society of Great Britain over this important question; if he was aware that the terms of the order, made under the Defence Regulations prescribing the conditions of sale, had not been made known to the society; and why this matter was decided and given publicity without the professional organisation most concerned in the distribution of this product, particularly for National Health dispensing, being informed.—Mr. W. LEONARD, parliamentary secretary to the Ministry of Supply, said: We have not yet completed our arrangements for the distribution of penicillin. Discussions with the Pharmaceutical Society are taking place. No control order has so far been made.

Incidence of Diphtheria

Replying to a question, Mr. A. BEVAN stated that the provisional number of cases of diphtheria notified in England and Wales in 1945 was 18,571, and of deaths 720. The ages of the cases were as follows:

	Notifications	Deaths
Aged 0–	188	18
1–	1086	113
3–	2001	120
5–	5948	257
10–	3467	74
15–	3330	45
25 and over	2421	93
Unknown	130	0
	18,571	720

Replying to a further question, Mr. J. WESTWOOD gave the following figures for Scotland:

	Cases		Deaths	
Age-group	Imm.	Non-imm.	Imm.	Non-imm.
0– 4	267	1175	1	76
5–14	1104	1151	5	29
15+	153	810	–	15
Totals	1524	3136	6	120

Blood-transfusion Service

Sir W. WAKEFIELD asked the Minister of Health if he was satisfied that he had adequate supplies of blood for transfusion purposes; and what steps he was taking to ensure that a sufficient number of donors was available.—Mr. BEVAN replied: The Emergency Blood Transfusion Service has had difficulty in recent months in obtaining adequate supplies of blood. I have arranged for a film on this subject to be shown in cinemas and for a series of local campaigns to take place during the summer months throughout the country to encourage people to give blood. The need is as urgent now as it was in war-time. I hope those who have helped will continue to do so, and that new helpers will enrol when an appeal is made in their locality.

Mr. E. H. KEELING: Will the Minister consider forming a branch of blood-donors in this House, especially as a little blood-letting might do some Members good? (Laughter.)—Mr. BEVAN: Certainly, I will encourage that, and I would like to apportion the donors. (Laughter.)

Family Census

Major TUFTON BEAMISH asked the Minister whether he would discontinue the practice of sending form F.C.4 to those persons who had expressed their unwillingness to fill in the proforma at present being circulated by the Royal Commission on Population and headed "family census, strictly confidential"; and whether he was aware that the practice of sending out the form had caused the recipients considerable annoyance.—Mr. BEVAN replied: I am informed that F.C.4 is a formal letter issued by the commission which gives those women who did not want to supply census particulars to a local enumerator an opportunity of supplying them confidentially and direct by post to the commission's headquarters. The response to this letter has been gratifying and will do much to make the voluntary family census a success. This part of the work will be completed in about a fortnight's time, after which no further copies of F.C.4 will be issued.

Extension of Woking and District Victoria Hospital

Mr. G. NICHOLSON asked the Minister whether he would now sanction the scheme proposed by the Woking and District Victoria Hospital for adding 50 beds to their accommodation by means of hutments.—Mr. BEVAN replied: I have considered this carefully in the light of the present position of building labour and materials, but I am afraid I cannot recommend the necessary licence at the moment.

Letters to the Editor

SHORTAGE OF NURSES

SIR,—All doctors, whether in general practice or attached to hospitals, are greatly concerned about the shortage of nurses and must be interested in possible remedies. The problem is so urgent that it must be faced even in the midst of our own professional upheavals.

Many suggestions have been discussed, and I wish to emphasise one which, if taken up on a national scale, might in my opinion go far to provide a permanent solution of this very serious problem. The remedy suggested has, I believe, already been tried in some places in a small way, but it could only have a real effect if carried out nationally.

There is a gap between the ordinary school-leaving age of girls and the age at which they are commonly admitted to our hospitals to begin a nursing training. In this gap many girls, keen to become trained nurses, are lost because they must take up other work and careers at once. A few, who can afford it, fill in the time by a training in domestic science.

I suggest that this gap might be filled by the foundation of a Cadet Nursing Training Corps, on a national basis, but with training schools or colleges distributed regionally throughout the country. Selected girls would enter immediately after leaving school, and the cadet school might be run on the usual three-term system with adequate holidays. In the training, elementary anatomy, physiology, cookery, and visits or demonstrations in hospitals would no doubt find a place. The training would largely or completely replace the concentrated three months of the preliminary training school in hospitals, and would allow practical work in the wards to be started at once.

The success of a Cadet Nursing Training Corps would entirely depend on its attractiveness to girls of the right age—attractive buildings and even attractive uniform. Everything in fact to create a pride in the work and the school. The questions of residence in school or at home, payment during training, and scholarships are all important but not fundamental.

A Cadet Nursing Training Corps might be started more easily in the first place by a body such as, for example only, the Nuffield Foundation, aided by medical and nursing organisations. Memories of direction and conscription, essential during the war, may be too recent for a successful start in other ways.

Department of Medicine,
University of Glasgow. J. W. MCNEE.

THE G.M.C.

SIR,—A recent case has led to considerable criticism of the General Medical Council, but the suggestion that lawyers should join the council is surely a bad one. We know that hard cases make bad law but we also know that *de minimis non curat lex*. If a doctor has offended against the ethics of his profession, he should be tried by his peers, and the issue should not be muddled by what may well be irrelevant legal details.

There are however two items that need reform. The first is the age of the members of the council. Anyone who has seen them in session will know that, though they present a nestorian aspect, they also show, as indeed their years compel, many of the physical signs of old age—a state which does not always encourage sympathy or percipience. The second possible danger to justice lies in the Hippocratic Oath. A man who has sworn never to divulge his patient's secrets is, if the patient rounds on him, unable to defend himself fully—an especial danger when adultery is alleged.

London, W.1. CHRISTOPHER HOWARD.

PSYCHOLOGICAL ASPECTS OF PSORIASIS

SIR,—The view held by a few patients with psoriasis that this is a healthy man's disease is indeed curious, as Dr. E. Wittkower observes (April 20, p. 566). But on p. 175 of J. A. Lindsay's *Medical Axioms* are found these words, attributed by him to Jonathan Hutchinson: "An attack of psoriasis is a certificate of good health."

Truro. H. PULLAR-STRECKER.

MILESTONE IN ANÆSTHESIA

SIR,—The respect which an anæsthetist has for physicians we must make every effort to reciprocate. But when he eases the minds of his anæsthetic colleagues about curare adjuvancy, as by his letter of April 20 (p. 591) he is bound to do, I cannot help feeling that Dr. Langton Hewer is showing himself an anæsthetist of the confident era. Lest the cases which he cites of a fortunate outcome of careless overdosage should persuade anæsthetists that endotracheal oxygenation is all that they require to combat poisoning by curare, I would plead with respectful reiteration not only for the endotracheal catheter to be early in position, but for the use of pure standardised preparations of curare alkaloids in *minimum* effective doses. I too have seen pretty "fantastic" dosage by curare followed by recovery with artificial respiration alone. But I have also seen embarrassing bronchial hypersecretion and a near fatality from sudden bronchospasm following the (intravenous) injection of a dose of "curarine" insufficient to abolish spontaneous respiration (*Lancet*, 1936, i, 12).

This bronchospasmodic action of curarine has been fully demonstrated in animals (*J. Physiol.* 1938, 91, 437) and I hope that Dr. Hewer will not encourage us to forget it until we know more about the pharmacology of curare alkaloids than we do at present.

Edinburgh. RANYARD WEST.

MASS RADIOGRAPHY

SIR,—Dr. Beynon suggests that my opinion is founded on unfamiliarity with the actual working of mass-radiography units. As he has "Since 1941 . . . followed with keenness Dr. Brailsford's writings on this subject" he ought to have appreciated that my criticisms, which were primarily based on many years' experience in teaching hospitals, were published before the Ministry propounded its scheme or installed units. They are adequately supported by the findings of those units, of which I have ample knowledge to justify my reiterated assertions.

He asked in a previous letter (March 16) the basis for my assertion that the miniature was inferior to the direct film, and it would seem from his later statement (April 27) that "the fundamental issue is not whether the large film is superior to the miniature film," followed by an acknowledgment of the miniature's inferiority, that he has adopted my view of their respective values. If he will again read my articles, he will find the answers to his latest requests for better alternatives.

He asks, "Would he waste valuable medical manpower in the taking of histories from the 93% of those examined who will be found to have radiologically normal chests?" I would not consider this a waste of time for any medical man if the patient had signs or symptoms of pulmonary disease or had been in frequent contact with open infection; a clerk may fail to elicit any of this evidence. Of the 7% abnormals, many show indefinite radiological appearances and perhaps no clinical signs, and offer no symptoms or suggestive history. After months or years of observation, one may decide that the shadows are not of progressive significance, and yet a few weeks later the altered condition of the patient may show the decision to have been erroneous. Even of those patients who continue to show radiographic appearances indicating active pulmonary tuberculosis a proportion remain at work, as Dr. Beynon will find if he repeats the examination of his industrial group in 6–12 months; treatment is not compulsory and, even when accepted, is not always curative.

Dr. Beynon says he can assure me "that abnormal cases get due attention at every stage and that their history is taken by a competent and experienced medical officer." The salary offered to medical officers (£750) for this mass-production is unlikely to tempt the competent and experienced physician, tuberculosis officer, or radiologist. Most of these realise that a good proportion of patients referred with symptoms or signs or histories of contact show no abnormal radiographic evidence; on the other hand, some show radiographic signs of early pulmonary tuberculosis which are undetected by competent clinicians who have the patient, with definite signs, symptoms, and history, before them. How can Dr. Beynon expect a high degree of accuracy when the most essential task of sifting the miniatures is done by probably the least experienced (certainly the worst-paid) member of the medical team, who has no patient or history to guide him, and who must in addition to his other work judge 920 miniatures and carry out an efficient examination of 60 patients in each eight hours of service? (Dr. Beynon's figures). I presume that as director he would supervise the 2880 per day.

He asks, "How can efficiency suffer when three separate teams are each working an eight-hour shift throughout the 24 hours?" Even if the most competent authorities were employed, the standard first attained would tend to degenerate, and with the less competent unnoticed, the deterioration would be still more assessable.

Finally Dr. Beynon has failed to grasp the meaning of my analogy of the few more rods. My point was that mass radiography (of any but the groups I indicated) is no more a measure for eradicating tuberculosis or materially diminishing its incidence, than would be the supply of more *rods* with more attractive bait for ridding a lake of infected fish. The comparison can be carried further: some through fear or illness will not bite; some have been caught before, and once bitten twice shy; while even those caught and thrown back into the pool as uninfected may indeed be recently infected. Others cured or unaffected may be damaged, infected, or even killed, in the process; yet no matter how many are caught the pool will still contain its infectious residue to which all are exposed.

I am confident that he will succeed in detecting more and more cases of pulmonary tuberculosis, but I am equally confident that with this meretricious scheme for the eradication of tuberculosis he will do little more than add to the responsibilities and anxieties of his associated tuberculosis officers.

Birmingham. JAMES F. BRAILSFORD.

PRECAUTIONS WITH THROAT PACKS

SIR,—Deaths have been recorded as a result of failure to remove the throat pack when tracheal tubes are withdrawn after tonsillectomy.

I have recently instituted a simple routine to avoid such accidents.

All throat packs are soaked in 'Vaseline' and kept in a separate tin on the anæsthetic trolley. Thus no packs can possibly be involved in the sister's swab count at the end of the operation. The lid of the tin is red, and across it in white letters is painted "throat pack in." Directly the tin is opened the lid is hung up on the trolley in a prominent position. It is not replaced until the pack is removed from the throat.

Devonport. H. PARRY-PRICE.

PARASCHMITZ DYSENTERY

SIR,—In his article of April 20 (p. 573), Dr. N. H. Martin writes, "Most of the reports have come from India, the Middle East, and the Mediterranean littoral."

The Schmitz-like organisms form a group, which might well be called the Schmitz group, in the same way that one speaks of the Flexner group.

Some years ago I described one of these Schmitz-like organisms, which produced attacks of typical mild bacillary dysentery in two young male Europeans, whose blood agglutinated the organism in dilutions up to about 1 in 200. The blood of these two patients would not agglutinate a strain of *Shigella schmitz* obtained from the National Collection of Type Cultures (N.C.T.C.) at the Lister Institute; nor would the N.C.T.C. organism agglutinate with antisera made by injecting the isolated strain into rabbits. We did not give our strain a name (it was known in the laboratory as *B. youngi*), and the culture I intended to send to the N.C.T.C. was lost while I was on leave; but fairly full details of it were reported.[1]

At that time the *Shigella schmitz* was not officially accepted as a cause of illness in human beings; the organism is mentioned in the Medical Research Council's *System of Bacteriology*, but only as a very doubtful and uncorroborated cause of bacillary dysentery. Views have changed since then.

St. Margaret's Hospital, Epping, Essex. FRANK MARSH.

1. Marsh, F. *J. trop. Med. (Hyg.)* 1929, 32, 205.

ŒSOPHAGEAL SPEECH

SIR,—Your leading article of March 2 says that the acquisition of œsophageal speech after removal of the larynx, once a rare achievement, is now the normal outcome. The method is, however, by no means new; it was described, almost exactly as it is used today, by my teacher, G. Gottstein, some fifty years ago.

He showed his first case at the 29th congress of German surgeons in 1900; the patient, eighteen months after laryngectomy, was able to talk and sing with a "pseudo-voice," as it was named by Landois. A second patient (*Allg. med. ZentZig.* 1905, no. 34) had good œsophageal speech only 6½ weeks after operation. As assistant surgeon at the Jewish Hospital at Breslau, I later operated with Gottstein on several patients who subsequently developed œsophageal speech.

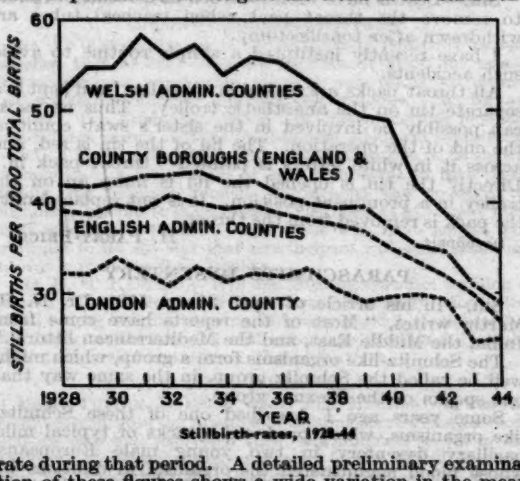
At that early date Gottstein was aware of the vocal mechanism at the entrance to the œsophagus; he also measured with a spirometer the quantity of air required for the intonation of the various consonants and vowels. Gottstein may thus be remembered as having understood and practised the principles of œsophageal speech several decades before the technique was generally adopted.

Tel-Aviv, Palestine. WILLIAM BOSS.

THE SECULAR TREND IN THE STILLBIRTH-RATE

SIR,—In England and Wales there are at present about 20,000 stillbirths a year, a figure equivalent to 65% of the total infant deaths under 1 year of age. This large wastage of life at birth is particularly serious in view of the declining birth-rate. Though the stillbirth-rate is steadily falling, the possibility and the importance of a further reduction have yet to be more widely appreciated.

Stillbirths have been registrable in England and Wales since the middle of 1927. The figures published by the Registrar-General for the seventeen years 1928–44 make it possible to investigate the trend in the stillbirth-



Stillbirth-rates, 1928-44

rate during that period. A detailed preliminary examination of these figures shows a wide variation in the mean stillbirth-rate between different areas. The data divided into four groups—London administrative county, the other English administrative counties, the English and Welsh county boroughs, and the Welsh administrative counties—show very clearly the differing experience in the four types of area, and that their relative positions are unchanged in the whole period. (The experience of the urban aggregates did not differ significantly from that of the rural aggregates, and so they have not been kept separate.) The stillbirth-rate does not appear to increase with density of population, since the Welsh counties have a considerably worse experience than the aggregated county boroughs in England and Wales. In recent years the inequalities between the groups have become less marked.

The trend in each group is more or less the same—an initial slight rise until 1932 or 1933, followed by an increasingly rapid decline. The slight rise may be due in part to defective registration in the early years, and so no significance can be attached to it. Thereafter the decline is definite. It is especially worthy of remark that it should have accelerated under war conditions, when so many factors would appear to militate against it. Does it perhaps reflect the increased care which has been taken of the health of pregnant women during the war?

In the Welsh counties the decrease between 1938 and 1944 is no less than 33% of the pre-war figure—an astonishing reduction. In London, despite the bombing, the corresponding decrease is 18%. Little is yet known of the basic causes of stillbirth, and of the relative influence of social and of more specific factors. The reasons for the decline are therefore obscure and further investigation is necessary.

Institute of Social Medicine, Oxford. IAN SUTHERLAND.

OPERATION FOR VARICOSE VEINS

SIR,—It was suggested to me that during the operation of high resection of the internal saphenous vein the manipulation, clamping, and section of the vein caused a marked fall in blood-pressure.

I have taken careful observations on some twenty consecutive cases operated on by Mr. R. R. Foote. In no case was I able to find any marked change in blood-pressure throughout the operation. In a certain number of cases there was a slight but insignificant rise of pressure at the time of section of the vein.

London, S.W. F. BARNETT MALLINSON.

Towards Social Security

Behaviour during Sickness

WHEN friendly societies began, in early times, to pay cash allowances to their members who were unfit for work they felt a need for some supervision over the claimant beyond that exercised by his doctor. The committees and officers in financial charge of diminishing funds, sometimes too small for their proclaimed purpose, set to work to devise checks and tests which could be used to winnow out the doubtful cases. As may be imagined, these provisions varied considerably between society and society; but as they were adopted (in theory at any rate) by the members as a whole in general meeting, people who did not like them had to accept them as part of the price of voluntary membership.

When compulsory insurance was introduced in 1912 a measure of uniformity was required, and thus we have what are called the Rules for Behaviour during Sickness.

The most prominent rule is the one stipulating that the claimant shall not be absent from his place of residence for the time being between a specified time in the evening and a specified time in the morning. These times vary between winter and summer and between society and society. There is a further provision that a claimant shall not be absent at *any* time without leaving word where he may be found. There is also a general proviso under which the society may, if it thinks fit, exempt the member from the operation of this rule upon such conditions, if any, as it may impose; but in practice, of course, members hardly ever trouble to apply for permission to be out after hours, even when they have good cause, and the problem arises only as a result of an unexpected evening call from the sickness visitor. In the hands of reasonable people such a rule can be tolerated; but the instructions to local officers under the new Ministry of National Insurance will have to be framed so that decisions will be based on all the circumstances of the case. For example, a claimant suffering from a simple fracture and living in overcrowded conditions ought—especially in the summer months—to be allowed automatically some latitude in the hour for returning home. Many cases could be instanced where it would be medically wise for a patient to be out in the fresh air as much as possible and where he could not be expected to leave at home a detailed statement of the route he proposes to take.

Again, the standard rules forbid the patient from doing "any kind of work, domestic or other," except light work undertaken as a part of medical treatment in an institution, or work undertaken in training for some other occupation. Clearly, such a written rule would not have survived in recent years unless it had been viewed with a Nelsonian eye. Obviously it needs

radical overhaul in the light of medical opinion, since it is now recognised that mental or physical activity is often an essential part of the process of restoration to normality.

Two things are necessary. First, the administrators must rethink their rules with medical help. Secondly, the new form of administration must provide simply and naturally for the doctor's advice on a particular case to be the predominant factor in the day-to-day decisions on the niceties of behaviour during sickness. JUSTINIAN.

Public Health

Payment for Treatment of School-children

THE Education Act of 1944 imposed for the first time on local education authorities the duty of providing medical treatment (other than domiciliary) for children attending maintained schools. The Minister of Education, in consultation with the British Medical Association, the British Hospitals Association, and the local education authorities, has been considering how the expenses of this new service can best be met. As a national basis it has now been agreed that the authorities shall pay voluntary hospitals three-quarters of the cost of treatment for inpatients and outpatients, subject to maxima of £1 4s. per patient-day for teaching hospitals and 18s. for other hospitals. The authorities will also make additional payments to hospitals for distribution to their consulting physicians and surgeons. For each inpatient £1 1s. will be paid to cover any period up to seven days, and for outpatients 10s. 6d. for each new case to cover attendances up to three months. Existing arrangements for payment for operative treatment of tonsils and adenoids, mastoid diseases, and squint may stand. Where authorities enter into a contract with consultants for treatment given at school clinics or hospitals there will be a fee not exceeding £3 3s. for a session of two hours or of 12s. 6d. for each case. These arrangements are retrospective with effect from April 1, 1945. They are designed to tide over the period till the National Health Service comes into operation, and are subject to review at the end of 1947.

Births and Deaths in the First Quarter

The Registrar-General's Weekly Return for May 11 gives provisional figures for births, marriages, and deaths in the quarter ending March 31. There were 181,445 births—an increase of 3498 compared with the corresponding period last year, and the birth-rate of 17·2 per thousand population is 0·3 above that for the first quarter last year, and only 0·2 below the high rate recorded in the first quarter of 1944. The average for the first quarters of the five years prior to 1945 was 15·7. The difference between the number of stillbirths was so small—5178 compared with 5190 in the first quarter of last year—that the rate of 0·49 per thousand population applied for both periods.

Deaths totalled 155,153 against 157,745 a year ago, making the rate 14·8. This is 0·2 below that of the corresponding period in 1945 and 0·9 below the average for the first quarters of the five previous years.

Infectious Disease in England and Wales

WEEK ENDED MAY 4

Notifications.—Infectious disease: smallpox, 0; scarlet fever, 945; whooping-cough, 2147; diphtheria, 367; paratyphoid, 6; typhoid, 5; measles (excluding rubella), 2711; pneumonia (primary or influenzal), 610; cerebro-spinal fever, 58; poliomyelitis, 3; polio-encephalitis, 2; encephalitis lethargica, 1; dysentery, 212; puerperal pyrexia, 168; ophthalmia neonatorum, 98. No case of cholera or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on May 1 was 1131. During the previous week the following cases were admitted: scarlet fever, 39; diphtheria, 38; measles, 104; whooping-cough, 30.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 3 (0) from measles, 13 (4) from whooping-cough, 3 (0) from diphtheria, 55 (4) from diarrhœa and enteritis under two years, and 14 (1) from influenza.

Liverpool reported 11 deaths from diarrhœa and enteritis.

The number of stillbirths notified during the week was 264 (corresponding to a rate of 30 per thousand total births), including 34 in London.

Obituary

SIMON FLEXNER

M.D., D.SC., LL.D.

Simon Flexner, who died in New York on May 2 at the age of 83, was born at Louisville, of Jewish parents; his younger brother, Abraham, won distinction as an educator and writer on pedagogics. He was educated at local schools, before entering the University of Louisville, where he qualified in 1889. He studied for a time at Johns Hopkins Hospital and made several trips to Europe, visiting Strasbourg in 1893, Paris in 1900, and Berlin in 1904. In 1895 he was appointed associate professor of pathology at Johns Hopkins University, and three years later he was promoted to the chair of pathological anatomy. In 1899 he accepted the appointment of professor of pathology at the University of Pennsylvania, where he remained until 1903, when he became director of the Rockefeller Institute for Medical Research. He retained this post until he retired in 1935.

Underwood

Of Flexner's many contributions, the most memorable are those on cerebrospinal fever and poliomyelitis. He proved that a successful antimeningococcal serum could be produced and its therapeutic value assessed; and he and his American colleagues were among the first to show that poliomyelitis can be transmitted to monkeys and is due to a virus.

F. R. F. writes: When Simon Flexner was director of the Rockefeller Institute, the resident appointments at the institute hospital were held by a small group of young men who came from various countries throughout the world and were graduates of universities that differed widely in their forms of education and training. Their common characteristics were devotion to medicine and the probability that they would themselves become teachers of medicine in the universities of their own countries. Flexner joined the residents at lunch whenever he could, and on these occasions he would describe recent progress in some field of research, weighing and integrating the contributions of this worker in America, of that one in Europe, or of a third in Asia, and suggesting lines of further investigation. He would talk about medical education in many lands, telling us more about our own medical schools than we ourselves knew; and he would draw us out so that we began to see new aspects and new significance in our own experiences. His mind was essentially critical, but his criticism was kindly and constructive, and its purpose was usually practical, with the advancement of preventive or curative medicine as its goal. Those of us who assisted, however humbly, in his researches were especially fortunate, for we had to strive to reach his technical accuracy and to share his mental discipline; and we learned how crucial is the difference between the proven and the plausible. The group was scattered by the first world war, but the survivors have all found places where they in their turn have influenced their younger colleagues. The interest of Simon Flexner was a source of strength and pride which has supported them in their difficulties and strivings. The memories that come to mind are of a strong and vigorous personality, of an intellect moulded by scientific discipline, and of a tolerant and affectionate friendship. He was a leader, and his influence on medical science has been a powerful factor in the great advances of his time.

WILLIAM FRANK LYDSTONE DAY

M.B. CAMB.

Dr. W. F. L. Day, who died at Truro on April 27 at the age of 68, was the third of four generations of doctors in his family. His grandfather was Dr. F. N. Day of Chudleigh, his father Dr. R. N. Day of Harlow, Essex, while his own elder son, Dr. F. M. Day, is acting

medical officer of health for Hammersmith. Educated at Cheltenham College, Caius College, Cambridge, and at St. Mary's Hospital, London, he obtained his M.B. in 1903, and after holding house-appointments at the South Devon and East Cornwall Hospital, Plymouth, he became resident medical officer at the borough sanatorium, Brighton. At Cambridge he narrowly missed his blue for cricket, and later he played for Cornwall. During the 1914–18 war he served with the R.A.M.C., and on his demobilisation he returned to the West Country as assistant tuberculosis officer for Cornwall, later becoming county tuberculosis officer. He retired during the last war owing to ill health. His wife, a daughter of the late Dr. Williams, M.O.H. for Plymouth, survives him with two sons.

On Active Service

CASUALTIES

DIED AS PRISONER OF WAR

Captain WILLIAM SERVICE AIRD, M.B. Glasg., R.A.M.C.

DIED

Lieutenant ROSETTA CATHERINE BARKER, M.B.Belf., R.A.M.C.
Major MURDO BUCHANAN, M.B. Glasg., R.A.M.C.
Major VIVIAN ROY CLIFTON, M.B. Sydney, R.A.M.C.
Captain JOHN MICHAEL HAMER, M.R.C.S., R.A.M.C.
Captain ALAN ROSS SHERIFF, M.B. Durh., R.A.M.C.

WOUNDED

Lieut.-Colonel A. G. FERGUSSON, M.D. Glasg., R.A.M.C.
Major HILDA ROBERTS, M.B.C.S., R.A.M.C.

Medical Diary

MAY 19–25

Tuesday, 21st

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Orthopædics.* Short communications.
LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital for Diseases of the Skin, Leicester Square, W.C.2
5 P.M. Dr. J. E. M. Wigley: Eczema.

Wednesday, 22nd

ROYAL SOCIETY OF MEDICINE
5.30 P.M. *Endocrinology.* Sir Walter Langdon-Brown: Inaugural Address.

Thursday, 23rd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. J. Charnley: Conservative Treatment of Fractures of the Femoral Shaft. (Hunterian lecture.)
ROYAL SOCIETY OF MEDICINE
8 P.M. *Urology.* Mr. A. H. McIndoe: Congenital Deformities of the Penile Urethra.
MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Dr. W. Norwood East: Crime and Maturity.
ROYAL PHOTOGRAPHIC SOCIETY, 16, Princes Gate, S.W.7
6.30 P.M. *Medical Group.* Papers and discussion: Methods in Medical Photography.
LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. W. N. Goldsmith: Acneiform Eruptions.

Friday, 24th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Epidemiology and State Medicine.* Dr. P. G. Stock: Progress and Problems in Port Health Administration.
SOCIETY OF MEDICAL OFFICERS OF HEALTH
2 P.M. (B.M.A. House, Tavistock Square, W.C.1.) Dr. J. J. Buchan: Organisation of Medical Work.

Saturday, 25th

ROYAL SOCIETY OF MEDICINE
Pædiatrics. Meeting in Birmingham.
MIDDLESEX COUNTY MEDICAL SOCIETY
3 P.M. (Shenley Hospital, near St. Albans.)

Appointments

BADENOCH, A. W., M.D., CH.M. Aberd., F.R.C.S.: asst. surgeon, St. Peter's Hospital for Stone, London.
BOYLE, T. McM., M.B. Leeds, F.R.C.S., D.L.O.: aural surgeon, General Infirmary, Leeds.
LIPWORTH, MAX, M.D. Edin., M.R.C.P.E.: factory surgeon for Manchester, S.E. Lancs.
LLOYD, J. E. S., M.D. Lpool, M.R.C.P., D.P.M.: medical superintendent, Tooting Bec Hospital, L.C.C.
MACLEOD, CAMERON, F.R.C.S.: consulting surgeon, Essex County Hospital, Wanstead.
MILNER, J. G., M.B. Camb., F.R.C.S.: ophthalmic surgeon, Charing Cross Hospital, London.
SHUCKSMITH, H. S., M.B. Leeds, F.R.C.S.: asst. surgeon, General Infirmary, Leeds.
SIMMONS, H. J. A., M.B. Camb.: factory surgeon for Manchester, S.W. Lancs.

Notes and News

EDINBURGH STUDENTS AND THE BILL

AT a meeting in Edinburgh on May 3, organised by the Royal Medical Society and the University Medical Association, Dr. A. F. Wilkie Millar said that, while he agreed in principle with the measures in the National Health Service Bill, he was perturbed by the separation of clinic and hospital control; he was also opposed to appointment by the Minister of committees with a wide range of power. In the loss of goodwill he saw a drift away from the essential doctor-patient relationship, in which the physician gave of his best to maintain the value of his practice. Finally, in receiving State support, the doctor would be divided in his allegiance. Sir Alexander Macgregor said that as a medical officer of health he had experienced none of the bureaucratic disadvantages that some people feared. He objected, however, to the omission of preventive medicine from the Bill. Prof. Sydney Smith considered that the Bill offered an unequalled opportunity for the coördinated advance of scientific medicine. The newly qualified practitioner could enter the service at a reasonable salary instead of working as an underpaid house-man whose main duties were clerical. He envisaged greater mobility of hospital staffs, and suggested a period of probation after qualification during which the young doctor should be under the control of a senior member of the profession in hospital or elsewhere.

Students who spoke approved of the broad principles of the Bill, and emphasised that it was for the profession, by its criticism and support, to make the service the best possible. The new challenge of direction (in the general sense) by a director must be taken up. In summing up, Dr. Wilkie Millar said that there appeared to be as much indecision among the unqualified as among the qualified members of the profession.

PROTECTION DURING IMMERSION

ONE of the problems which had to be overcome during the war was that of devising suitable protection for aircrew and others who ran the risk of prolonged immersion in the sea. Early research showed that three criteria must be fulfilled: (1) the free circulation of cold water round the body must be prevented; (2) a layer of heat-insulating material between the body and the sea must be preserved; and (3) any protective garment must be comfortable. A "flying overall" that answered these requirements was finally devised by the combined efforts of the Royal Air Force Institute of Aviation Medicine and the Cotton Research Association, with the help of British manufacturers. It is made of a special Oxford weave cloth with 'Tropal' interlining. A 5-oz. interlining supports a 12-stone man in water and retains its buoyancy almost indefinitely; it has insulated bomber crews against cold, and kept fighter pilots cool in the heat of the cockpit. Squadron-Leader E. A. Pask, M.B., writes in the current issue of the *Maker-up* that a man immersed in the northern waters of the North Sea in winter might die in 10 minutes and be incapacitated in a considerably shorter time; under these conditions the suit kept aircrew warm and dry while they inflated and boarded emergency rubber dinghies. Even after prolonged immersion the suits still provided protection by hindering the circulation of cold water round the body. The materials used in the manufacture of the overalls will be available for civilian clothes, including waterproofs.

FORESTALLING FIRES

ALL hospitals take a serious view of the possibility of fire, and guard against outbreaks. But it often happens, when emergencies come rarely, that equipment becomes obsolete and people become bored, unless special trouble is taken to keep both up to the mark. King Edward's Hospital Fund for London, after conferring with the chief regional fire officer for the London region of the National Fire Service, have just published a revision of their memorandum on Fire Precautions.[1] Responsibility for providing against the danger of fire naturally lies with the hospital committees, and the King's Fund do not attempt to say how far their suggestions may apply to any given hospital; but the notes here presented will help any committee to decide whether the fire precautions in their hospital are adequate. They cover fire risks in storerooms, cupboards, kitchens, and in other places likely to be locked at night; risks from heating, lighting, and power,

1. Obtainable from the King's Fund, 10, Old Jewry, London, E.C.2. Pp. 8. 6d.

and from the storage of inflammable material (especially X-ray films which give off poisonous fumes on combustion); and risks due to accumulations of rubbish and litter. Fire-fighters should be able to get into roof-spaces and vaults without difficulty, and enough rescue-ladders should be provided; fire-exits should be clearly marked. Equipment, whether hand appliances or hose, should be ample, and kept in good condition. The responsible fire officer, who must see that drills and inspections are carried out, should have charge of all equipment and also of the alarm apparatus. In an outbreak the fire service should be summoned at once, without waiting to see whether the hospital equipment will suffice; and someone should be sent at once to the hospital entrance to direct the firemen to the scene of the fire. The memorandum ends with some general rules for treating different types of fires, and with an appropriate set of directions to be hung in the porter's lodge or beside the telephone switchboard.

Most hospitals will find some useful advice in the memorandum, which should itself prove a good precautionary measure.

BERIBERI IN A EUROPEAN OFFICER IN SOMALILAND

BERIBERI has recently been observed[1] in a European officer, aged 29, who was admitted to hospital after living 6 months in the Mijertein. The district, which is about 900 feet above sea-level, is very unhealthy, the shade temperature averaging 100° F, and often rising to 110° F. These conditions caused the patient to lose 20 lb. in weight, and no doubt predisposed him to beriberi through anorexia and gastro-enteritis. On admission there was œdema of the legs and severe polyneuritis, so that he was unable to rise from the squatting position. The heart was dilated and there was triple rhythm. The liver was somewhat enlarged and tender. The food taken by the patient had equalled or exceeded normal requirements with three exceptions: (1) thiamine (vitamin B_1) was 100·6 International Units (I.U.) below standard; (2) riboflavin (vitamin B_2) was 1·49 mg. deficient; and (3) vitamin D was 279 I.U. below requirements. The author disregards the last item on account of the high degree of natural radiation in the country. The patient's alimentary troubles must certainly have diminished absorption of other food elements, but to what extent it is impossible to calculate.

Immediate improvement followed the administration of thiamine, and yeast in the form of 'Marmite.' The œdema cleared up in a week; the patient was ambulant in two months, though he still had difficulty in mounting stairs. The cardiac impulse passed well inside the nipple-line, and the triple rhythm disappeared. The patient ultimately recovered completely.

THE VOLUNTARY SPIRIT

Sir Robert Gower, who appealed in a letter to the *Times* (April 4) for the retention of the spirit of voluntary service, is to sponsor the formation of an advisory council, which will support organisations whose status is threatened by legislation. A considerable number of people in private and public life have associated themselves with this aim. Sir Robert Gower's view is that, under the terms of pending legislation, the voluntary medical organisations are to be sacrificed on the altar of administrative neatness.

PROSPECTS FOR ALMONERS

DURING the past year the Hospital Almoners' Association and the Institute of Hospital Almoners amalgamated to form the new Institute of Almoners which now takes over the responsibility of managing the affairs of the profession. It will select and train candidates, grant certificates, and keep a register of qualified almoners. There are now 650 certificated almoners in the country—nearly twice as many as in 1939. The first annual report for 1945 of the new Institute notes that 208 appointments were made during the year, 67 of them to hospitals where certificated almoners had not been employed before. The demand for trained workers in this field always exceeds the supply, thanks to growing recognition of the value of the almoner's services. Not all hospitals yet realise, however, exactly what those services should be, and an appendix to the report, defining the almoner's functions, repays study. Her chief task is to help people "both through the best use of their own capabilities and through the resources of the family and community, to overcome personal and social difficulties, and to achieve the fullest possible measure of health and happiness." She is thus a considerable force in the psychological treatment of patients, and as such should not be hampered by the traditional service, associated with the name "almoner," of administering hospital or public charity. However, some hospital authorities still wish the almoner to prevent the abuse of the hospital facilities by patients able to pay fees, and to assess patients' ability to contribute to treatment. "These duties," the report states, "are clearly subsidiary to the main function of the almoner." Fortunately they are likely to become unnecessary under the prospective National Health Service.

1. Charters, A. D. *E. Afr. med. J.* 1945, **22**, 397.

MAKING HOSPITAL APPOINTMENTS

A NOTE under this heading in our last issue described the new procedure for making hospital appointments adopted by the Middlesex County Council. We should have made it clear that the novelty of this procedure lies in the fact that the selection of the candidates and their reduction to a very small number is to be made by a professional committee including not only senior medical members of the council's staff but also expert assessors from outside, probably nominated by the University of London.

University of Oxford

On May 2 the degree of doctor of medicine was conferred on J. F. Loutit and on J. N. Mills (in his absence). The degree of bachelor of medicine was conferred on M. B. McEvedy and T. H. S. Burns.

University of Cambridge

Dr. E. B. Verney, F.R.S., has been appointed to the newly formed Sheild professorship of pharmacology. The readership now held by Dr. Verney is to lapse. Other new medical posts include readerships in bacteriology, morbid histology, and medicine, and a research assistantship in pharmacology.

University of Manchester

Mr. Ernest Matthews, D.D.S., has been appointed professor of prosthetic dentistry and director of the prosthetics department of the university from Sept. 29 next. Mr. Matthews is at present lecturer in dental prosthetics in the university. Mr. Harry Brindle, at present senior lecturer in pharmacy, has been appointed professor of pharmacy in the university from Sept. 29 next.

Royal College of Surgeons of England

At a meeting of the council on May 9, with Sir Alfred Webb-Johnson, the president, in the chair, Prof. R. V. Bradlaw was re-elected a member of the board of examiners in dental surgery. It was decided, subject to the grant of the necessary powers, to establish a faculty of dental surgery in the college.

Dr. G. M. Vevers and Dr. A. J. Durden Smith were admitted to the fellowship.

The Walker prize was presented to Prof. E. C. Dodds, F.R.S., the John Hunter medal and triennial prize to Dr. Joan Ross, and the Begley prize to Mr. Otto Fleischner.

The council accepted the trusteeship of the Cecil Joll memorial fund, under which a triennial prize will be awarded for some surgical subject.

The Chase Farm Hospital, Enfield, the Seamen's Hospital, Tilbury, and the Broad Green Hospital, Liverpool, were recognised in respect of the resident surgical post required of the candidates for the final fellowship examination.

Diplomas of membership were granted to the candidates named in the issue of May 4 as having passed the final examination of the Conjoint Board, with the exception of six who already held the diploma. The diploma was granted also to J. R. Handforth, who has passed the final examination of the board.

Diplomas in medical radiodiagnosis and in medical Radiotherapy were granted, jointly with the Royal College of Physicians, to the candidates named on May 4.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting, with Mr. W. A. Sewell, the president, in the chair, J. D. P. Graham (Glasgow) was admitted a fellow of the faculty qua physician.

Nutrition Society

The society is to hold a conference at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, on Saturday, May 18, at 2 P.M. The subject will be Nutritional Experiences in Prisoner-of-war and Internment Camps in the Far East. Papers will be read by Lieut.-Colonel J. Bennet, Dr. D. A. Smith, Prof. R. G. Scott MacGregor, Dr. R. C. Burgess, Dr. E. K. Cruickshank, and Dr. Cicely Williams. The discussion will be opened by Dr. J. V. Landor.

Society for Relief of Widows and Orphans of Medical Men

The annual general meeting was held on May 8 with Dr. R. A. Young, the president, in the chair. During 1945 £4800 was distributed among fifty-five widows. Each widow over sixty-five years of age received £75 and the others £60. A Christmas present of £15 was also made to each widow. The members of the society now number 282 and the invested capital is over £140,000. Membership is open to any medical man living within 20 miles of Charing Cross, and further particulars may be had from the secretary of the society, 11, Chandos Street, London, W.1.

Hunterian Society

The Hunterian Society last week restored its yearly custom—broken by the war years—of a dinner to commemorate John Hunter's birthday. This year, the 218th anniversary, the guests included the presidents of the Colleges of Physicians and Surgeons, Sir Andrew McFadyean, Sir Malcolm Hilbery, K.C., and the Deputy Master of the Society of Apothecaries. Sir Malcolm Hilbery, proposing the toast of The Society, suggested that the profession was exposed to a double danger—fracture-dislocation with its past, and aneurinism. Mr. A. E. Mortimer Woolf, the retiring president, in his reply, appealed for the preservation of tradition. "There is a fashion today for tradition to be swept away. Tradition born of experience should be handed down from generation to generation." Lord Moran, F.R.C.P., questioned whether the tendency towards techniques had gone too far. The learned professions had lost their leisure, and thereby had largely ceased to be learned. Material progress there had been, both in medicine and surgery; but were we advancing in the moral sense? Some of our leaders sometimes seemed rather lacking in tolerance, which was the ultimate reward of education. Sir Alfred Webb-Johnson, F.R.C.S., named Hunter and Harvey as the founders of British medicine. Hunter's claim to fame was his encouragement of the experimental method.

X-ray Advisory Committee for the Colonies

The National Association for the Prevention of Tuberculosis has formed a special committee to advise on X-ray methods and apparatus in the British colonies. The chairman is Dr. R. R. Trail, and the members are Dr. J. M. Cruickshank (representing the Colonial Office), Mr. J. T. Ferrier, Dr. A. Stephen Hall, and Dr. Harley Williams (secretary).

British Spas Federation

Lord Horder presided over the annual meeting of the federation at Harrogate on May 9, when members sent a telegram to the Minister of Health expressing their wish to play their part in the treatment of rheumatism and allied diseases in the National Health Service. In his reply, Mr. Bevan said that he hoped to develop diagnostic and research centres associated with the major hospitals. "The precise relationship of the spas to these facilities," his message ended, "will need careful working out, but the subject is very much in my mind, and I am glad to take note of the federation's desire to be coöperative."

Returning Thanks

In recognition of the work of doctors from Durham City and the neighbourhood at the railway disaster at Browney Colliery last January, the divisional general manager of the London and North Eastern Railway has sent a cheque for 50 guineas to the treasurer of the Royal Medical Benevolent Fund. Another cheque for 50 guineas has been sent to the Durham County Hospital in recognition of the services of the medical and nursing staffs.

Rehabilitation of Displaced Persons

In the course of a Chadwick lecture delivered in London on May 7, Major Eyre Carter said that the plans for displaced persons in Europe were based on three cardinal principles—speed, orderliness, and welfare. The speed exceeded the most optimistic expectations. In May and June, 1945, Western displaced persons were returning by truck, train, and aeroplane, at the rate of over 40,000 a day. This disturbed the welfare arrangements, except for the basic requirements of food, which was obtained from Army stocks, and delousing, which was done with D.D.T. powder so effectively that it prevented the importation of typhus into western Europe. A million or more Jews, Poles, Yugoslavs, and Balts have yet to be repatriated or resettled; this problem is political rather than administrative, and it would be rash to prophesy when it will be solved.

Heberden Society

A general meeting will be held at 11, Chandos Street, London, W.1, on May 31, at 5.30 P.M. Mr. H. Jackson Burrows and Dr. George Graham will speak on Spinal Osteoporosis of Unknown Origin.

Association of Port Health Authorities

The 47th annual meeting of the association will be held at the City Chambers, Edinburgh, from May 28 to 30. Among the speakers will be Dr. M. T. Morgan, who will read a paper on Some Aspects of the Control of Smallpox, and Dr. W. P. Cargill, who will talk on Developments in Disinfestation.

Continental Surgeons' Visit

For the delegation of seven Belgian and six French surgeons who attended the conference of the Association of Surgeons in London on May 7–8 the British Council has arranged a tour ending on May 24. Arrangements have been made at Manchester by Prof. Harry Platt, at Oxford by Prof. Hugh Cairns, and at Edinburgh by Prof. J. R. Learmonth.

Air Vice-Marshal Kenneth Biggs has been appointed an honorary physician to the King.

Dr. Peter Reid has been appointed chief medical officer to the UNRRA mission in Czechoslovakia. Dr. Reid, who spent many years as chief medical officer to oilfields in Peru and Iraq, has been released from the R.A.M.C. to take up his new post.

The Central Medical War Committee announces that Dr. S. Charles Lewsen has resumed civilian practice at 83, Wimpole Street, W.1.

Sir Hubert Henderson has been appointed chairman of the Royal Commission on Population in succession to Lord Simon, who has resigned.

The publication of *Rheumatism*, interrupted by the war, has now been resumed with an issue for April. This quarterly journal is distributed for the Charterhouse Rheumatism Clinic by the Rolls Publishing Co., Ltd., 2, Breams Buildings, London, E.C.4.

Mme. Dora Rubin would like to get in touch with the two British doctors whom she met in the summer of 1940 while taking clothes, food, and medical supplies to the Prisoners of War British Hospital St. Raphael in Lille. Her address is 22 rue de Finisterre, Brussels, Belgium.

The amalgamation of two firms of surgical instrument manufacturers, Messrs. Down Bros. and Messrs. Mayer & Phelps, has been announced. The personal managements remain as heretofore.

Births, Marriages, and Deaths

BIRTHS

DANCKWERTS.—On May 8, at South Hayling Island, the wife of Captain Richard Danckwerts, R.A.M.C.—a daughter.

EDWARDS.—On April 30, at Leamington Spa, the wife of Lieut.-Colonel G. F. Edwards, M.B.E., R.A.M.C.—a daughter.

HARTLEY.—On May 7, at Rye, the wife of Dr. J. L. Hartley—a daughter.

JORDAN.—On May 4, at Oxford, the wife of Colonel A. Jordan, R.A.M.C.—a son.

KING.—On May 3, at Wellington, New Zealand, the wife of Dr. A. S. King (formerly of Balmore, West Newport, Fife)—a son.

LAUGHLIN.—On May 9, the wife of Dr. John Laughlin—a son.

MILLER.—On May 6, at Grantown-on-Spey, the wife of Dr. R. A. Miller—a daughter.

O'HIGGINS.—On April 17, in Dublin, the wife of Dr. P. O'Higgins—a son.

RENDALL.—On May 7, at Abingdon, Berks, the wife of Dr. D. C. S. Rendall—a son.

ROLLASON.—On May 5, at Weston-super-Mare, the wife of Flight Lieutenant W. N. Rollason, M.B., R.A.F.V.R.—a son.

SUCHET.—On May 2, in London, the wife of Lieutenant Jack Suchet, R.A.M.C.—a son.

WOODGATE-JONES.—On May 7, in London, the wife of Dr. N. P. Woodgate-Jones—a daughter.

MARRIAGES

CURRIE—GARLAND.—On May 4, at Richmond, Surrey, Donald Currie, major I.M.S./I.A.M.C., to Ysobel Marian Garland.

DEATHS

BEST.—On May 7, at St. Ives, Cornwall, William Harris Best, M.R.C.P., aged 80.

CARPENTER.—On May 7, Hayward Carpenter, M.B. Lond., of Ryde, Isle of Wight, aged 54.

COUNSELL.—On May 4, at Oxford, Herbert Edward Counsell, M.A. Oxfd, F.R.C.S., aged 82.

WESSON.—On May 8, in London, Arthur Sewell Wesson, M.D. Lond., F.R.C.P., F.R.C.S., aged 41.

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(*Lancet*, 19th Feb., 1944, p. 264)
(*Medical Press and Circular*, 22nd Nov., 1944, p. 333)
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(*Medical Press and Circular*, 17th Oct., 1945, p. 257)

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